This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

507 .U58 NO.25 C.1
Contributions to the n
Stanford University Libraries
3 6105 046 412 933

LIBRARY OF THE
Leland Stanford Junior University

NOT TO BE TAKEN OUT OF THE LIBRARY

Department of the Interior:
U. S. NATIONAL MUSEUM.

DEC 23 189

BULLETIN

OF THE

UNITED STATES NATIONAL MUSEUM.

No. 25.

CONTRIBUTIONS TO THE NATURAL HISTORY OF THE BERMUDAS.

VOLUME I.

EDITED BY

J. MATTHEW JONES and GEORGE BROWN GOODE.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1884.

Department of the Interior:
U. S. NATIONAL MUSEUM.

—31—

BULLETIN

OF THE

NITED STATES NATIONAL MUSEUM.

No. 25.

PUBLISHED UNDER THE DIRECTION OF THE SMITHSONIAN INSTITUTION.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1884.

LELAND STANFORD JUNIOR
LIBRARY
UNIVERSITY.
A11430

ADVERTISEMENT.

This work is the thirty-first of a series of papers intended to illustrate the collections of natural history and ethnology belonging to the United States, and constituting the National Museum, of which the Smithsonian Institution was placed in charge by the act of Congress of August 10, 1846.

It has been prepared at the request of the Institution, and printed by authority of the honorable Secretary of the Interior.

The publications of the National Museum consist of two series—the Bulletins, of which this is No. 25, in continuous series, and the Proceedings, of which the sixth volume is now in press.

The volumes of proceedings are printed signature by signature, each issue having its own date, and a small edition of each signature is distributed to libraries promptly after its publication.

From time to time the publications of the Museum which have been issued separately are combined together and issued as volumes of the Miscellaneous Collections. These are struck off from the stereotype plates from which the first edition was printed, and in this form are distributed by the Smithsonian Institution to libraries and scientific societies throughout the world. Volume 13 of these collections includes Bulletins 1 to 10 inclusive; volume 19, vols. 1 and 2 of the Proceedings; volume 22, vols. 3 and 4 of the Proceedings; and volume 23, Bulletins 11 to 15 inclusive.

Full lists of the publications of the Museum may be found in the current catalogues of the publications of the Smithsonian Institution.

SPENCER F. BAIRD,
Secretary of the Smithsonian Institution.

SMITHSONIAN INSTITUTION,
Washington, *June* 1, 1884.

BOTANY OF BERMUDA.

ERRATA IN PART II., BULLETIN NO. 25, U. S. NATIONAL MUSEUM.

Page 35, line 26: for "pine" read *fine*.
Page 38, line 24: for "low" read *law*.
Page 45, line 7: for "Lance" read *Lane*.
Page 59, line 18: for "Ayland" read *Hyland*.
Page 59, line 21: after "wood" insert a semicolon.
Page 60, line 21: for "medeira" read *Madeira*.
Page 65, line 4: for "Vitch" read *Vetch*.
Page 65, line 17: for "tiliqua" read *siliqua*.
Page 68, line 12: for "Caffra-brom" read *Kaffir-boom*.
Page 68, line 20: for "perniferum" read *peruiferum*.
Page 73, line 14: after "Japan-medlar" insert *Loquat*.
Page 73, line 27: for "Lip plant" read *Life plant*.
Page 79, line 26: for "thoris" read *koris*.
Page 84, line 5: for "hetorophylla" read *heterophylla*.
Page 85, line 24: for "spendens" read *splendens*..
Page 88, line 8: for "shore" read *share*.
Page 91, line 14: for "gnaphalodes" read *gnalphaloides*.
Page 96, line 14: for "aryroncara" read *argyroneura*.
Page 104, line 15: after "obscure" insert a comma.
Page 105, line 18: for "atropha" read *jatropha*.
Page 113, line 32: for "ovedoxa" read *oreodoxe*.
Page 114, line 18: for "Vershafelii" read *Vershaftii*.
Page 127, line 17: for "atropha" read *jatropha*.
Page 128, line 9: for "coriandum" read *coriandrum*.
Page 128, line 31: for "Hogwood" read *Hogweed*.
Page 128, lines 37–38: for "98" read 80.
Page 128, for line 57 insert *Jatropha* .... 105.
Page 129, line 48: for "Pane" read *Plane*.
Page 131, line 5: dele *With* .... 64.
Page 131, for line 10 insert *Yellow wood* .... 56.
Page 134, line 53: for "tiliqua" read *siliqua*.
Page 134, line 60: for "Brugmonsia" read *Brugmansia*.
Page 136, line 5: for "argyroncara" read *argyroneura*.
Page 137, line 53: for "J. Jatropha" read *J. curcas*.
Page 139, line 1: for "Pipearceæ" read *Piperaceæ*.
Page 139, line 41: for "guayva" read *guava*.
Page 140, line 8: for "flabilliformis" read *flabelliformis*.
Page 141, line 3: for "stenataphrum" read *stenotaphrium*.
Page 141, line 12: for "Swietinia" read *Swietenia*.

CONTRIBUTIONS

TO THE

NATURAL HISTORY OF THE BERMUDAS.

EDITED BY

J. MATTHEW JONES AND GEORGE BROWN GOODE.

VOL. I.

PART I.—GEOLOGY .... BY PROF. WILLIAM NORTH RICE.
PART II.—BOTANY .... BY GEN. SIR JOHN HENRY LEFROY.
PART III.—MAMMALS .... BY J. MATTHEW JONES.
PART IV.—BIRDS .... BY CAPT. SAVILE G. REID.
PART V.—NOTES ON BIRDS .... BY DR. C. HART MERRIAM.
PART VI.—REPTILES .... BY SAMUEL GARMAN.
PART VII.—ANNELIDS .... BY PROF. H. E. WEBSTER.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1884.

PREFACE.

The Bermudas or Somers Islands, since their discovery in 1515, have given origin to a literature of very considerable extent. Not only have they been the subject of discussion in many a book of history and travel, they have inspired the poetic fancies of Thomas Moore and Andrew Marvell, and supplied Shakespeare with an environment for "The Winter's Tale." The natural history of this little archipelago has also been a fruitful subject of description from the days of Sil Jourdan and his quaint old black-letter volume, "The Wreck of the Sea Adventure." The literature of the islands, as will be shown in a bibliography to be published in a subsequent part of this work, includes many papers of considerable importance from a scientific standpoint.

The "enchanted isles" have proved very attractive to naturalists, especially during the past decade, and to the old list of observers, containing such names as those of J. Matthew Jones, Sir William Reid, Sir Henry Lefroy, Lansdowne Guilding, H. B. Tristram, J. L. Hurdis, Col. H. M. Drummond-Hay, Colonel Nelson, Dr. J. J. Rein, and Colonel Wedderburn, must be added those of Sir Wyville Thomson and his assistants on the Challenger staff, especially John Murray and H. N. Moseley, Prof. W. G. Farlow, Mr. Walter Faxon, Dr. C. Hart Merriam, Mr. J. W. Fewkes, Prof. William North Rice, Dr. G. W. Hawes, Dr. F. M. Hamlin, and Prof. A. S. Bickmore. The field of marine zoology is as yet hardly touched. No place can be more suitable for a laboratory of biology.

The only book in which a general survey of the flora and fauna of the islands has been attempted is in "The Naturalist in Bermuda," an octavo volume of 200 pages, published in London in 1859, by John Matthew Jones, Esq., F. L. S., barrister, of the Middle Temple. This work is full of interest and suggestion. It bears upon its title page as its legend, the well-known saying of White of Selborne, "*Every kingdom, every province, should have its own monographer*," was conceived and executed in the spirit of a true disciple of the Hampshire sage, and received a well-merited encomium from Darwin in his Origin of Species.

In "The Naturalist in Bermuda," Mr. Jones made no attempt to grapple with marine zoology, the book being devoted almost entirely to the land animals and plants. The lists are all, of course, very incomplete in the light of subsequent discoveries, but the book is a classic, and will always remain so. Since 1859, a number of special papers have been published by Mr. Jones, and by others; and a series of faunal lists, very nearly complete for vertebrates, is given in Mr. Jones' Visitors' Guide to Bermuda, printed in 1876.

Dr. T. L. Godet, in his "Bermuda," published in 1860, attempted to discuss the zoology of the islands, but his chapters on "natural history," "shells," and "corals" give evidence not only of ignorance of but shameful dishonesty in his methods of book-making.

The plan of the work, of which the first instalment is now published, was arranged by Mr. Jones and the writer of this preface in the spring of 1877, at the close of a second winter of joint exploration of the islands. Mr. Jones has collected in Bermuda for several winters, between 1859 and 1876, and has become the standard authority on matters relating to the natural history of the islands. It has been our purpose in our joint work to bring together in convenient form that which is known of the natural history of the islands, and to make a complete series of faunal and floral lists, to serve as a starting point for future works in the study of the region.

In the present volume are printed seven separate papers.

Professor Rice's essay upon the Geology of the islands (Part I) is the result of a careful reconnaissance during a six weeks' visit in the spring of 1877. The previous work of Nelson and Thomson, and the discussion of the region by Dana, have been taken into consideration in the preparation of this paper.

The Bermudian Flora, by Sir John Henry Lefroy (Part II), is the result of the studies of that eminent geographer while governor of the islands from 1871 to 1877, most of the specific identifications having been made at the Royal Botanical Gardens, Kew. An especial feature of interest in this paper is the thorough manner in which the native flora has been differentiated from the extensive exotic flora, which has been energetically increased by the Bermudians since the very beginning of the colony in 1609. It is of great value, too, as a record of the successes of Sir Henry Lefroy himself in acclimatizing numerous species. During his administration, two or three hundred species of trees, shrubs, and plants were introduced from different quarters, particularly from the Royal Gardens at Kew, which will greatly extend the interest of the Bermudas as a botanic garden.

The catalogue of Bermuda Mammals (Part III), by Mr. J. Matthew Jones, is one of the monographs, which will probably never be extended unless by the addition of certain species of whales.

Capt. Savile G. Reid's essay on Bermuda Ornithology (Part IV) is the final result of the labors of Jones, Hurdis, Wedderburn, and others, and may be regarded as a final report. Much of the completeness of this list is due to the labors of a most ingenious local collector, Mr. John T. Bartram, of Stock's Point, whose little museum is full of interesting material.

Dr. C. Hart Merriam, in a short visit to the islands in 1878, discovered one or two additional species of Birds, which, by special request, he records in Part V.

Mr. Samuel Garman's paper on Bermudian Herpetology (Part VI) is undoubtedly a final statement. The discussion of the marine turtles in this paper is of great general interest.

Professor Webster's paper on the Annelids (Part VII) is only a beginning, being based upon a very incomplete collection gathered in connection with other work.

A number of other papers are in preparation, and it is hoped that they may be completed within the next year. Among these are a second edition of the present writer's Fishes of Bermuda, and papers on the Crustaceans, by Prof. S. I. Smith; the Radiates, by Prof. A. E. Verrill; the Sponges, by Prof. A. Hyatt; the Spiders, by J. H. Emerton; and the Mollusks, by J. Matthew Jones.

G. BROWN GOODE.

WASHINGTON, *April* 2, 1884.

t, lies
when
t with
g the
from
ar out
ships
id the

rst ap-
s. All
gether,
e of 23
ce that

n coast
latitude
on from
eastern
m south
r space
mingled
her veg-
masses,
s, which
of fishes
ese float-
owe the
ly during
surface is
ng in im-

Bull. No. 25, U. S. National Mus

INTRODUCTION.

By J. Matthew Jones, F. R. S. C.

Alone in mid-ocean, about 600 miles east of the Carolina coast, lies the little group of islets known as Bermuda. In former days, when light-houses were few and far between, and navigation was beset with greater danger and difficulty, these islands were counted among the greatest terrors of the deep; lying in the track of merchantmen from Europe to America, and surrounded by barrier reefs extending far out to sea, they too often became the last home of mariners, whose ships were driven in fury upon the breakers and dashed to atoms amid the seething foam.

There are no bold scenic effects to impress the visitor on his first approach; no elevated peaks or cone-like craters, nor hillside gorges. All is on a small scale, and although with islands and rocky islets together, over three hundred may be counted, yet the whole lie in a space of 23 miles by 3, and so slightly raised are they above the ocean surface that the very highest point of land only reaches 250 feet.

The Gulf Stream flows between the Bermudas and the eastern coast of the United States, trending to the northeast as it reaches the latitude of New York, thus affording the ocean to the southward protection from the cold winds of the north during the winter months. On the eastern edge of this heated concourse of waters which circle around from south to northeast are the Bermudas; while within this semicircular space float vast masses of Gulf-weed, the *Sargassum bacciferum*, intermingled with driftwood, seeds of trees and plants, and abundance of other vegetable matter bearing upon its surface, or within its tangled masses, myriads of mollusks, crustaceans, and other invertebrate forms, which float hither and thither as the winds direct, while thousands of fishes frequent these aquatic preserves to feed upon them. It is to these floating masses of Gulf-weed that the northern shores of America owe the presence of isolated examples of tropic fishes taken generally during the later months of summer. During that period the ocean surface is rarely disturbed by violent storms, and the Gulf-weed floats along in immense fields, propelled both by the swift, warm current and southerly winds to a far more northerly point than usual; indeed, instances are known, one very recently, where turtles have been captured while floating on the water within 100 miles of Halifax.

The denizens of this favorable cover, thus brought within a comparatively short distance of the northeast coast of America, wander away right and left, and many strike the shores and are captured, to afford wonder to those who are unaccustomed to their singular forms. Thus it is that on the coast of Nova Scotia are found, almost every summer, examples of West Indian ***Balistes***, ***Fistularia***, ***Hemirhamphus***, ***Exocœtus***, &c., also the well-known "Portuguese Man-of-War" (***Physalia pelagica***); while many large seeds of West Indian plants, such as ***Entada scandens***, ***Mucuna urens***, and others chiefly belonging to the family ***Leguminosæ***, are picked up at Sable Island, which lies 80 or more miles off the Nova Scotian coast.

North and west of the islands, at a distance from shore in some directions of 10 or more miles, lie what are known as the outer reefs, a belt of submerged rocks coated with ***Serpulæ***, whose hard, irregularly-twisted calcareous tubes often form incrustations an inch or more in thickness, and various other forms, particularly nullipores, stony seaweeds of a rosy color, which occur as wart-like processes on all portions of the reef rock. Within the outer reefs, and coating the inner edges of these submerged rocks, grow numerous species of corals.

Thousands of other objects help to form the population of these outer reefs and contribute not a little to their growth, while myriads of tropic fishes lurk in the snug holes and corners formed in the wave-worn rocks. Through certain channels in this reef vessels reach the harbors within; but without the aid of the pilots, a daring, clever set of fellows, with eyes as sharp as hawks and nerves that never fail, it would be useless to attempt an entrance.

The latitude of the light-house on Gibb's Hill is 32° 15′ 4″ N.; longitude, 64° 51′ 36″ W. In shape the Bermudas form a narrow elongated strip of land about 23 miles long, running east and west, bent inwards at one extremity like a fish-hook, and indented throughout by inlets, with numerous little inlets scattered over the whole extent. The distance from Cape Hatteras is about 600 miles; and from Halifax 750 miles. The land lies very low, but it is pleasingly diversified throughout its whole area with little hills and dales. It is covered over large areas with groves of cedar (***Juniperus barbadensis***), having an underwood of sage bush (*Lantana odorata*) and (*L. camara*). A few depressions, slightly below the sea level, are wet and marshy, and are grown up with coarse grasses, reeds, and sedges, with palmettoes and cedars where the ground is dry, and mangroves and avicennias where it is muddy. There are no lakes, streams, or wells of fresh water, the only water-supply being derived from the clouds. The roofs of the houses are sloped and whitewashed so as to allow the rain to run freely into tanks under ground; some of these are of large size and keep an abundance of water perfectly clear and fresh for two or three months, if droughts should occur.

The climate, during the winter months of November, December, January February, and March, is simply charming, the thermometer usually ranging from 60° to 70°. Cool and pleasant breezes almost continually prevail; and as may well be imagined from its position on the wide ocean, the air of Bermuda is the purest of the pure.

The trade of Bermuda is carried on by a dozen or more island vessels and others from England, United States, Nova Scotia, and Prince Edward Island. The island vessels are built of cedar, the most durable of all woods; but as that timber is getting scarce, ship-building is not carried on to the extent it was formerly. The principal exports are onions, tomatoes, and potatoes, chiefly to New York, during the months of April, May, and June. Arrowroot has also been for many years a well-known Bermudian product, commanding a high price in every part of the world.

Bermuda is a British military post, and there is one line regiment always garrisoned there, as well as artillery and engineers; and the dock-yard is one of the stations of the West Indian squadron of the British navy.

The following brief topographical description of the islands is here presented as an introduction to the special natural history papers which are to follow, and which often contain reference to special localities. It should be read in connection with the map.

Beginning at the eastern extremity of the archipelago, we observe upon the map.

St. George's.—This was once the chief town of the islands and residence of the governor; but Hamilton, which is more centrally situate, was chosen in its stead about the latter part of the last century. The town is quaint and interesting; the streets are so narrow that in places two portly persons would almost jostle each other in passing. They were constructed when carriages were unknown on the islands.

These narrow streets, winding up the hill on which much of the town is built, with their gardens hemmed in by high walls, over which hang different species of cacti, with papaws, bananas, and plantains towering above, and here and there the graceful form of the palmetto surmounting the same, will remind the visitor of a small Spanish or Eastern town.

To obtain a good view of the harbor and surrounding country the visitor should proceed either up to the Signal Station or Barrack Hill, from which will be obtained an extensive prospect. Not far beyond the barracks and eastward of them, is a small cove on the northern shore, known as "Building's Bay," said to be the place where, in [illegible] Sir George Somers had his cedar vessel, in which he proceeded to Virginia, built. There are three or four strong forts commanding the channel through the reefs on the north side.

Smith's Island, forming the southern boundary of St. George's harbor, is quite small. It is here that some of the best arrowroot is grown and manufactured; and this island also furnishes most of the pilots who hail from the east end of the islands. There is a whalehouse here, which is now, however, rarely used, as the whale fishery has been much neglected of late years. In its many pretty little bays and inlets a variety of shells and sea-weeds may be obtained; thousands of sea anemones occur in the clear shallow water, and many species of crustaceans and echinoderms may be collected on the white sandy bottom, which renders their forms wonderfully conspicuous.

Castle Harbor.—This charming sheet of water, the beauties of which, on a bright sunny day, with sufficient breeze to ripple the surface of the azure waters, are not to be excelled in any part of the world, is an excellent collecting place. The day's work should commence by a visit to Castle Island, which commands the entrance to the harbor. The visitor can only land upon the island at one spot on its southern side. Here are the ruins of what many years ago was a fort of some importance, known as "The King's Castle;" the old brick oven, too, has become a cave with miniature stalactites. The island is about 270 yards long by 40 broad. It is a lonely, desolate spot, the home of the lizard and prickly pear (*Opuntia*).

In sailing along for Southampton Island, which is the next to attract attention, the entrance channel to Castle Harbor will be crossed, showing how intricate the passage must have been for the large West Indian mail steamers, which made this harbor their port of entry for some few years after 1842. Southampton Island was also fortified for the same purpose as Castle Island.

Nearly opposite Southampton Island, but at some little distance from the shore on the south side, stands "Gurnet Rock," an isolated mass, very interesting to an ornithologist, from its being almost the only spot in the Bermudas where breeds that rare bird, the dusky shearwater (*Puffinus obscurus*), which is evidently the curious bird mentioned by Capt. John Smith in his account of the Bermudas (which is included in his "History of Virginia") about two centuries ago, under the name of the "cahow." The rock cannot be landed upon in safety, owing to the almost continued swell of the ocean; and many are the hair-breadth 'scapes that have occurred when enthusiastic naturalists, who are somewhat rare in the Bermudas, have daringly attempted the task. The last effort was made by Lieutenant Reid, R. E., about 1874. Getting as near as possible in the boat, he had to make a spring just as the swell lifted her up the side of the rock; but although he luckily succeeded in making good his footing, he received some severe bruises from the jagged nature of the surface. His embarkation was happily effected without injury, and he had the pleasure of carrying home a fine young specimen of the bird which he had secured.

After passing Southampton Island the western shore of Nonsuch Island comes in view. This island now belongs to the military department. Several rare species of mollusks may be obtained in the sandy bays of its southern shore.

Cooper's Island next claims attention; here many shells and sea-weeds are to be found, as well as a few interesting plants growing on the sandy hillocks which are such conspicuous features in its scenery. If the day should be calm instead of breezy, the visitor will do well to pay attention to the curious objects beneath the waters of the harbor. The bottom is everywhere studded with reefs, on which grow corals, gorgonias, sponges, &c., in profusion, and if the boat be provided with a pair of long-handled nippers, any quantity of specimens may be obtained.

Mullet Bay.—About half a mile from St. George's, is Mullet Bay, one of the many pretty little inlets with which the islands are everywhere indented.

Stock's Point.—Past Mullet Bay, and forming its western shore, runs out toward Castle Harbor an irregular promontory known as Stock's Point. At the extreme end of this point, and situate in a pretty nook, is the residence of Mr. J. T. Bartram, whose collection of Bermudian stuffed birds and fishes is the only one of its kind in the islands.

The Causeway.—This bridge was constructed in England and sent out in pieces. Just at its end, on the Walsingham side, is a deep pool, which is known as "Blue Hole," in which many kinds of fish may be seen disporting themselves in the clear water.

Walsingham Caves.—About a quarter of a mile up the hilly road which leads from the causeway towards Hamilton, stands a small wooden shed on the left hand; while on the right, a rough and narrow road is seen, which leads to the famous caves which have afforded for many years the most singular scenes to be met with in the Bermudas. It would take pages to describe properly the various portions of these subterranean recesses, which present the usual appearance of stalactitic halls and spacious chambers, floored with transparent waters, on which no boat has ever yet been launched to explore the darkness beyond.

Walsingham.—The grounds about Walsingham are by far the most picturesque in the islands, presenting a singular chaotic appearance of broken rocks, caverns, and ponds, interspersed with grassy patches and thickets in which numerous kinds of trees and shrubs mat their foliage with that of the orange and lemon. Here may be found species of plants unknown in any other part of the islands, and in the clear waters which occur in almost every cavern mouth, the most brilliant-hued fishes may be seen. The coffee-tree grows luxuriantly at Walsingham, and a climbing jasmine overruns both rocks and trees profusely. The soil of this district is different to that of other parts, being of a bright brick-red.

Paynter Vale.—Not far from Walsingham, and snugly ensconced in a grove of fine old trees, lies all that remains of the old homestead of the Paynter family; the house a complete ruin, with ferns growing out of the crevices, and bananas, papaws, and cedars hemming in its remains on every side. Near what was formerly the principal entrance gate stands a magnificent fiddle-wood tree (*Citharexylum*), the parent of all the fiddle-wood trees in Bermuda. It was brought from Barbadoes about the year 1829.

A little east of the ruined house an avenue of tall tapering cedars leads to the old burial place of the family, which has recently been covered over with blocks of stone to prevent desecration. Climbing a steep hill near by, the visitor finds himself in full view of Harrington Sound, with the Flatt's Bridge and village in the distance, while a little higher he will find a patch of red ground, on which it is said nothing in the shape of vegetation has ever been known to grow. About 80 yards northwards of this patch, and situate in the adjoining wood, is a small cave, known as "Chalk Cave." On returning and recrossing the red patch, there will be seen on the left hand a deep hollow called "Plantain Hole," in which coffee, myrtle, wild cherry, fiddle-wood, and other trees are growing and entwining their branches together.

After leaving this cavernous depression and ascending the steep hill above for a short distance the visitor will come suddenly in view of Castle Harbor. Descending the slope before him and arriving at the shore he will find himself near the Government Limestone Quarry, from which large blocks of compact stone have been taken for building fortifications, and which is frequently referred to below in Professor Rice's paper on the geology of the islands. To the southeast is a cave called "Cooper's Hole," well worth a visit. Returning northwards, along the margin of the water, the visitor will perceive a current of water rushing almost under his feet, which is supposed to flow under the land from Harrington Sound. Still continuing northwards he will soon arrive at a rail fence, which, if he follows along through ferns, myrtle, orange, &c., will bring him to another deep hollow, called "Little Plantain Hole." At one time this was overrun with citron and orange trees; but very few, owing to the great disease of 1854, now remain. Still following the fence he will again arrive at the ruins of the old Paynter homestead, from which he started. Just outside the entrance gate, and across the public road, on the shore of Harrington Sound, will be seen a cavern in the cliff, which goes by the name of "Shark's Hole." If a boat can be obtained this cavern is well worth investigating, for several species of sea-weeds are to be obtained on the rocks on either side; while in the recesses of the cave beyond, by the aid of a torch, a beautiful collection of stalactites can be seen. A fine collection of stalactites from this cave are preserved in the National Museum and in that of Wesleyan University, Middletown.

Tucker's Town.—The land which lies between Paynter Vale and the south shore, including the long narrow neck which stretches out eastward to Castle Island, is known as Tucker's Town. Tucker's Town ponds are favorite resorts of the migratory water birds which visit Bermuda from the North American continent during the fall and winter months. Along the shores of these ponds the mangrove (*Rhizophora*) grows luxuriantly wherever congenial mud affords its roots a resting place.

The walks about the sand hills near the shore will be found interesting to the lover of nature, for many interesting maritime plants may be seen, while along the coral strand are found rare sea-weeds and shells, mingled with the pink-colored nullipore and *débris* of the reefs.

Devil's Hole.—This is a cavernous recess filled with salt water on the south side of Harrington Sound, about midway between Walsingham and the Flatts. For years it has been one of the "lions" of Bermuda, as it generally contains a stock of groupers (*Serrani*), and sundry other fishes; which swim about and can be as easily seen as if in an aquarium. Here will be found a species of ground shark, which, although not uncommon on the east coast of America, is, from its retired habits, very rarely seen. The angel-fish (*Holacanthus*) will be observed disporting itself in the clear waters, as if proud of its splendid livery. The groupers themselves are easily recognizable, as they crowd together with open mouths in hopes of a feed when the visitor arrives.

Harrington Sound, which lies before the visitor as he emerges from the entrance door to Devil's Hole, probably possesses in itself and its surroundings more picturesque scenery than any other locality in the islands. Its surface is usually calm, owing to its land-locked position, and a boating excursion on its waters, especially about the shores of Trunk Island, will reveal many submarine wonders to the eye of the naturalist, in the form of gorgonias, sponges, corals, and hosts of other things. Its northern shore, westward of Bailey's Bay Church, presents a series of high cliffs, in many places quite inaccessible, much to the satisfaction of the several pairs of tropic birds which here annually, in perfect security, make their nesting places and rear their young. From the water is seen the high cliff known as "Devil's Head," its face all ragged and torn by the storms of many winters. From out its numerous crevices spring dwarf trees and shrubs, whose only holdfast appears to be the solid rock on which they grow, while circling around its shattered brow the tropic birds lazily float, mingling their plaintive cries with the sounds of the rippling wavelets which dash on the rock-bound shore a hundred feet below. Harrington Sound, owing to the fact that the rise and fall of the tide is almost nothing, is one of the best places for collecting corals, such as *Millepora Oculina*, *Mœandrina*, *Porites*, *Mycedium*, and *Siderastrœa*. Here occur in great numbers the Bermuda scollop, *Pecten ziczac*, fished for at a depth of 5 or 6 fathoms by means of long-handled nipper.

Flatt's Bridge.—At the western end of Harrington Sound there is an outlet into Flatt's Harbor, through which the tide ebbs and flows with great impetus. This channel has from the earliest times been spanned by a bridge. In the torrent below the bridge Mr. Goode discovered *Amphioxus* in 1877, and this vicinity is one of the best collecting grounds in the islands. Much may be done by raking up stones and sponges from the bottom and examining their interstices for small animals.

Flatt's Harbor.—In days of yore this pretty little inlet of the sea presented a different aspect, for the shores, particularly at its head, were lined with wharves from which good-sized vessels discharged their cargoes. It was, in fact, one of the ports of Bermuda, and considerable trade was carried on here. Even now the extent of the ruins of several houses testifies to their capacity in former times. All, however, now wears a look of desolation; the moldering walls with the carved portals are draped with the prickly cactus, while gigantic papaws and plantains raise their leafy crowns above the whole.

Gibbons' Bay.—About a quarter of a mile from Flatt's Village, on the north shore road to Hamilton, on the right hand, will be seen a little sandy bay, with an island beyond, joined by a causeway of large stone blocks to the shore. The little bay to the right is known as Gibbons' Bay. It is an excellent place for collecting shells and sea-weeds, as also marine invertebrates, which are common under the stones and sand at low water. In the little rock pools here and along the north shore occur frequently groups of young *Velella*, while in the crevices of the rocks, after a northerly storm, may be found great masses of Gulf weed covered with pelagic crustaceans and hydroids.

Mount Langton.—Government House is situated on an elevated ridge of land, and commands a fine view of the sea-coast all along the north shore. The garden contains interesting examples of foreign trees, shrubs, and plants. It was here that Lady Turner, between 1826 and 1832, planted the first weeping willow ever seen in the islands, a species now very common. Governor Reid, about 1841, planted the India-rubber trees which stand near the steps leading down to the garden. The wampee and litchi trees were also planted by him. The large silk cotton trees in the garden were planted by Governor Elliott about 1850, and Sir Henry Lefroy, when governor, added largely to the list.

Peniston's Pond.—This beautiful little lakè, screened from the ocean by small hills covered with cedar, lies on the south shore of the islands, about a mile and a half west of the Devil's Hole.

The waters of Peniston's Pond are quite brackish, having communication with the outer sea by underground channels. In heavy southerly storms a perfect stream of water is forced over the shore rocks at the eastern end, giving it the appearance of a natural water-course, which is a rare sight in Bermudas except during a heavy rainfall. On the southern shore of this pond, about its center, and within a few paces of the water, are wells used for the purpose of watering cattle. The water they contain, like all similar excavations throughout the islands, is fresh above, but brackish beneath, as soon as the sea level is reached. This is, of course, owing to the simple reason that fresh water is lighter than salt. The islanders declare that there are "springs" of fresh water in various places. This is only true to the extent of supply furnished by percolation of rain water to the depth such springs are found in; a few weeks of drought would be sufficient to prove the fallacy of the assertion that such sources are really springs. Bermuda, which is merely the peak of a submarine mountain, rising to a height of nearly four miles from the bottom of the ocean, having its whole land area honeycombed throughout above, and most probably far below the level of the sea, can possess no fresh-water supply from below, and can only rely upon rainfalls for the necessary fluid. No *hard* water, therefore, is to be had in these islands; none but what the tanks supply, running from roofs and smoothed surfaces, constructed for the purpose. Peniston's Pond is a great resort of water fowl and waders, which visit Bermuda during the winter; and many a rare bird has been obtained by ornithologists in favorable seasons.

Spanish Rock.—A few yards east of the cattle wells spoken of, just at the base of the shore hills, an open grassy patch will be seen, having a mud hole about its center. After passing this, proceed up through the cedar grove in front, and immediately at the top a little pathway will be seen leading to the cliff beyond. Care must be taken on approaching this precipice, for if a false step be made, there is nothing to prevent a fall of fully 100 feet into the foaming waters below. The flattened rock, on which is an inscription consisting of a monogram and the date 1543, supposed to have been made by the Spaniard, Ferdinand Camelo, is cut, is a little below the crest of the cliff. It is one of the oldest historical monuments in America.

Hungary Bay.—About three miles from Devonshire Bay, along the coast westward, is Hungary Bay, an excellent place to gain some idea of what a tropical mangrove swamp must be. This is, of course, only one on a very small scale; but still the mangrove grows luxuriantly here. With the exception of the crabs which climb the trees, hardly a sign of animal life is observable. Fine specimens of *Littorina scabra* occur on the trunks of the mangrove trees near the mud. *Melampus flavus* and *M. Redfieldii* also occur in abundance under stones at the edge of the mud Near the entrance to this bay on the eastern side will be seen the ruins of a building formerly used us a magazine. A battery existed here also.

It was just inside the mouth of the bay that, in the month of January, 1860, the largest example of the ribbon fish (*Regalecus*) ever yet seen was captured. The head and some other portions of the fish were forwarded as a present to the British Museum. The total length of the specimen was 16 feet 7 inches.

Regaining the public road again, the visitor is now only a mile or so from the capital town of the islands.

Hamilton.—Incorporated June 30, 1793, and named after the then governor, Henry Hamilton, the town has very slowly but steadily increased in size.

Below the hill on which the Sessions House stands is the "Public Building," erected in 1839. Here are the "Custom-House," "Colonial Office," "Public Library," "Council Chamber," &c., while on the landing of the upper staircase are a few cases containing enough natural history specimens to make the visitor regret that the inhabitants do not possess sufficient enterprise to establish a museum. No place in the world presents the facilities Bermuda does for the collection of marine specimens; and as nearly all could be preserved in alcohol, there is less excuse for the omission. It is hoped, however, that ere long the tide of improvement will at last reach "the remote Bermudas," and that institutions generally established in other communities for their benefit and satisfaction will be considered necessary in this.

There are several interesting localities within walking distance of Hamilton which will well repay the trouble taken in reaching them. Proceeding along the public road going to the eastward, skirting the shore of Hamilton Harbor, and before the end of the harbor is reached, there may be seen four fine specimens of the cabbage palm (*Oreodoxa oleracea*) with trunks as smooth as ivory, and bearing above the curious bunch of foliage which, from its resemblance to the vegetable in question, has given the tree its name. One or two specimens of the cocoanut palm (*Cocos nucifera*), are also to be seen here, as well as numerous shrubs, natives of the West Indies. At the end of the wall which skirts this property will be seen in a cottage garden a tree possessing to all appearances crimson leaves. This is the fire plant, or burning bush (*Poinciana pulcherrima*), and the gaily colored leaves will be found to be merely the elongated petals of the flower. At the bend of the road round the harbor head, and immediately by the guard wall, in the dark, offensive looking mud, several mangrove trees grow, having attached to the roots and lower parts numbers of an oyster-looking shell (*Perna ephippium*). A little further on, on the right-hand side of the road, will be observed a fine tamarind tree (*Tamarindus indica*) standing in a neat little garden, while on the left, just beyond the tanks, runs along the wall side a hedge of the "snuff plant" (*Buddleja americana*).

Paget Sand Hills.—This sterile locality, which is an extremely wild and lonely spot, is well worth a visit, and close examination also, for here can be seen the mode adopted by nature to form the Bermudas; viz, drifting sand gradually increasing its deposits and elevating the land; thereby overcoming cedar groves and cultivated ground, and in one place even the dwelling of man.

On arriving at the northeast corner of the sand hills, the encroachment of the drifting sand will at once be perceived, as the mass, some 10 feet in depth, is now gradually covering a small garden. According to the observations made by persons residing close to, this overwhelming body has advanced over the cultivated land about 80 yards during the last twenty-five years. At the northeast corner of the hills will be seen, among some oleander trees near the top, the chimney of a cottage which formerly stood there, inhabited by a colored family. It is now wholly buried in the drifting sand, save the chimney, which alone rises above the mass to show the position of the structure.

With the exception of a few irregular patches here and there, and the long reach of white sand gradually encroaching on the cultivated ground at the northeast corner, the whole slope, which some twenty years ago was almost wholly clear drift sand, with a few patches of bent grass in scattered spots upon it, is now clothed with wild plants and shrubs, as well as young cedars, which will no doubt in a few years attain goodly dimensions, and, with the aid of the universal underwood of sage-bush, put an end to the further encroachments of the sand drift.

On the western side of the sand hills there is now a plateau of about half an acre, or perhaps more, of hardened drift sand, forming gradually into rock. On its face are cracks filling with drift sand, showing that the sun doubtless affects this hardened surface. Elevated protuberances of a foot or so in height, rise amid this plateau, having each a hole or depression at the center. These denote the sites in which cedar trees formerly grew. At the east end of the hills may be seen the gradual decay of cedar stumps, exhibiting more clearly the several stages of change, which are the more worthy of study in consequence of the light they throw upon the many curious chimney-pot looking structures everywhere to be met with on the Bermuda shores.

Indeed, the naturalist, on carefully observing the whole appearance of these sand hills, and taking into consideration the facts which are so prominently placed before him, will be able to form a very fair idea of the circumstances under which the Bermudas attained their present elevation after the great submergence.

At the foot of these hills, along the shore, runs a charming stretch of sandy beach.

At low water, and almost within wading distance of the beach, will be seen a series of "boilers" as they are locally termed, *i. e.*, rounded masses of rock hollowed within, containing sea water, having their margins raised by incrusting *serpulæ*. The origin of these boilers, which occur all round the shores, has never been satisfactorily ascertained, and would form a very interesting source of inquiry for any one desirous of advancing scientific knowledge.

The Royal Engineer Quarries.—These quarries, where the most compact stone to be found in the islands is procured for the purpose of building fortifications and other Government work, are situate upon the shore about a quarter of a mile east of the sand hills.

The Light-house.—This commanding structure, which possesses one of the most powerful lights in the world, is situate on the summit of Gibb's Hill. The light itself stands 362 feet above the sea level. From an elevation of only 10 feet above the water it can be clearly seen at a distance of 25 miles, while at 40 feet it can be easily distinguished 30 miles off.

There are some very pretty little coves under the light-house, having their shores irregularly indented by rocks which have in some places become detached from the cliffs above. Upon these rocks, and on the sides of the cliffs, grows a pretty species of stock (*Matthiola*), and in holes burrowed in the more friable rock, the tropic bird (*Phaëton*) makes its nest. Many species of algæ can be collected about the shore, and the conchologist must not forget that it was under stones at this locality where the Rev. J. B. Freer, in 1861, discovered the fine *Pupa*, an inch in length, which has never been taken since. Here, too, occurs in great quantities *Imperator calcar*, and also occasionally the large *Echinus esculentus.*

Somerset Bridge connects the island of Somerset or Sandy's with the main island. To the westward of the bridge, on a neck of land which protects the water of Elis Harbor from the ocean swell without, rises "Wreck Hill," so named from its being the spot from which the best view of the western reefs could be obtained, which have always been considered the most dangerous of all the reefs surrounding the islands.

Elis Harbor.—A perfect little gem of an inlet, which, to be seen in its greatest perfection, should be visited on a bright sunny day, when its waters appear of the lightest emerald tint. It is an excellent collecting ground for crustaceans, holothurians, and naked mollusks.

Mangrove Bay.—At the extremity of Somerset Island lies Mangrove Bay, so named from the number of those trees which formerly grew around its margin. The scenery is very pretty hereabouts, although the land is almost level with the water. Boat excursions about the bay and adjoining shores reveal many interesting forms to the naturalist, especially among the submerged rocks near the shore. On the other side of the neck of land which divides Mangrove Bay from the ocean lies a stretch of sandy beach well worth examining, for as it lies open to the heavy westerly gales, some fine specimens of sponges and seaweeds are often cast ashore.

Watford and Boaz Islands connect Somerset with Ireland Island, and do not contain much to interest the visitor, as their surfaces have been partially leveled by convict labor, during the time that Bermuda was unhappily burdened by the presence of the worst of criminals transported from the mother country.

Ireland Isle.—Probably the most important position in the Bermudas is Ireland Isle, which, although not much more than a mile in length, or a quarter of one in breadth, contains the dock-yard and other establishments connected with the Royal Navy. The Camber is a dock sheltered from the usual swell of the ocean by an excellent breakwater. But the principal feature of attraction is "the Great Bermuda Dock," a floating mass of iron, the largest structure of the kind in the world. In preparing the bed for this dock there was made an excavation to the depth of 54 feet below low water, and no less than 1,200,000 cubic feet of sand and coral *débris* were removed for that purpose. The geological teachings of this section are referred to in Professor Rice's paper.

The anchorage ground opposite Ireland, on its east side, where one or two men-of-war are generally to be seen, is known as "Grassy Bay."

There was an old lady living in Bermuda in 1876, aged 93, who well recollected the time when Ireland and Boaz were inhabited by fishermen, who lived in huts made of boughs of cedar, and brush for sides, and having the roofs thatched with palmetto leaves.

The Islands in the Sound.—The large sheet of water, which is inclosed by the curve of the land running from Paget Parish to Ireland Island, is known as "The Great Sound." It contains several islands, generally of small size, but the larger ones are very picturesque. Tucker's Island, which lies close in shore near Somerset Bridge, is well worth a visit, and the visitor should not omit to notice a lovely little cavern upon it.

Marshal Island and Godet Island lie east of the latter, and around their shores may be obtained many fine specimens of sponges, zoophytes, and small crustaceans.

Brackish Pond, an extensive morass about two miles east of Hamilton, on the skirts of which grow some fine specimens of cedar trees, while amongst the close thicket of shrubs and palmettos which tenant its interior some giant ferns and aquatic plants of divers species occur which are not seen in the open. In this dense region the ornithologist will find a good collecting ground, as owing to the difficulty of traversing the treacherous bog hardly any one disturbs the solitude which almost continually prevails here. Here also, up in the branches of the old cedars, and occasionally in the shrubs around, may be procured the curiously constructed nest of the tree rat (*Mus tectorum*), a species recently added to the Bermudian fauna.

PART I.

THE GEOLOGY OF BERMUDA.

BY

Professor WILLIAM NORTH RICE, Ph. D.,
OF WESLEYAN UNIVERSITY, MIDDLETOWN, CONNECTICUT.

TABLE OF CONTENTS.

	Page.
History and Literature of the Subject	5
Physical Geography of Bermuda	6
Is Bermuda an Atoll?	8
The Coral Limestone, and its varieties	9
Movements of Elevation and Subsidence	15
Has Bermuda subsided within historic times?	19
Erosion	24
The "Red Earth"	25
Phenomena resulting from the unequal hardening of the Limestone	26
Non-Calcareous Rocks and Minerals	29
Fossils	31

THE GEOLOGY OF BERMUDA.

HISTORY AND LITERATURE OF THE SUBJECT.

The Geology of Bermuda has already been the subject of more or less elaborate discussion by several authors. An important memoir by Lieut. (now Maj. Gen.) Richard I. Nelson, R. E., is contained in the Transactions of the Geological Society of London, Second Series, Vol. V., Part first, pp. 103–123. This paper is based on observations made in the years 1827–1833, while the author was stationed on the islands. The excavations made in the construction of the fortifications under his charge afforded him admirable opportunities for the study of the structure of the rocks, and his work gives evidence of thorough and conscientious investigation. Though written before the genius of Darwin and Dana had given the world the true interpretation of coral reefs and islands, and therefore failing to trace aright the history of the events recorded in the Bermudian limestones, this paper is invaluable to subsequent investigators as a store-house of facts. J. Matthew Jones, F. L. S., who has resided a number of years in Bermuda and paid much attention to its natural history, has given us important geological notices in his Naturalist in Bermuda,[*] and Visitor's Guide,[†] and various papers in the Proceedings and Transactions of the Nova Scotia Institute of Natural Science, and in Nature. In 1873 Bermuda was visited by the Challenger expedition, and important observations were made on the geology, as well as other branches of the natural history, of the islands. Some important points, notably the origin of the "red earth," were first explained by the naturalists of the Challenger. Bermuda forms the subject of an interesting chapter in Sir Wyville Thomson's work.[‡] Brief references to Bermudian geology are contained in the classical works of Darwin* and Dana;† but their treatment of the subject is less satisfactory than it would have been if these masters of the theory of coral formations had had the opportunity of visiting the islands. My own observations were made during a sojourn of a few weeks in the winter of 1876–'77. It is a pleasure to me in this connection to acknowledge my obligations to Prof. G. Brown Goode, of the Smithsonian Institution, J. Matthew Jones, F. L. S., Maj. Gen. Sir J. H. Lefroy, Governor of Bermuda at the time of my visit, Mr. James Carruthers, of Her Majesty's Dock-yard, and Mr. C. M. Allen, United States Consul, for calling my attention to interesting and instructive localities; and especially to Prof. James D. Dana for most important suggestions in regard to the problems presented by the islands, communicated in a conversation just before my visit.

---

[*] The Naturalist in Bermuda; a Sketch of the Geology, Zoology, and Botany of that remarkable group of islands; together with Meteorological Observations. By John Matthew Jones. With a map and illustrations. London, 1859.

[†] The Visitor's Guide to Bermuda. With a sketch of its Natural History. By J. Matthew Jones. London.

[‡] The Atlantic. A preliminary account of the general results of the Exploring Voyage of H. M. S. Challenger, during the year 1873 and the early part of the year 1876. By Sir C. Wyville Thomson. New York, 1878. Vol. I., Chapter IV.

PHYSICAL GEOGRAPHY OF BERMUDA.

The reefs and islands comprised under the name of Bermuda are nearly included between the parallels of 32° 10′ and 32° 20′ N., and between the meridians of 64° 40′ and 65° W. from Greenwich. The line of the outer reef incloses an approximately elliptical area, whose major and minor axes are respectively about twenty-five and about twelve miles in length. The major axis trends about N. 50° E. Only a very small part of the elliptical area thus described is dry land. The dry land is almost confined to the south-easterly side of the ellipse, forming a narrow and broken strip about fifteen miles in length, and nowhere more than three miles in width. The areas of the principal islands are as follows:

	Acres.
The Main Island	9,725
St. George's Island	706
Somerset Island	702
David's Island	527
Ireland Island	133

The whole area of dry land in the archipelago is estimated at 12,378 acres.‡

About three quarters of the whole area of dry land is included in the Main Island, or Bermuda proper. The line of the Main Island is continued north-eastward by St. George's and David's Islands. The south-western extremity of the Main Island bends around towards the north, and the curve is thence continued northward and north-eastward by the islands Somerset and Ireland. The hook-like south-west extremity of the Main Island, with its continuation in Somerset and Ireland Islands, incloses a lagoon called Great Sound. Two other lagoons are included within the chain of islands on the southeast side of the ellipse: namely, Harrington Sound, inclosed entirely by the Main Island, and communicating by a passage not exceeding 50 feet in width with the great elliptical lagoon inclosed by the outer reef; and Castle Harbor, inclosed by the eastern end of the Main Island, St. George's, David's, and several smaller islands. The central part of the Main Island is occupied by a peat-bog. The surface of this part of the island is elevated but little above the sea-level; and the peat, as I am informed by General Lefroy, extends to a depth of 40 or 50 feet below the sea-level—a depth about equal to that of the great lagoon inclosed by the outer reef. This bog appears to mark the situation of a small lagoon now entirely filled up.

---

* The Structure and Distribution of Coral Reefs. By Charles Darwin. Second edition. London, 1874. Appendix, pp. 264, 265.

† Corals and Coral Islands. By James D. Dana. New York, 1879. pp. 218–221, 361, 370, 391, 393–395.

‡ The Bermuda Pocket Almanack. Bermuda, 1877. pp. 60, 61.

The surface of the land is considerably diversified, though nowhere attaining any great elevation. The highest hills are only about 250 feet above the level of the sea.

In consequence of the small extent of the land both horizontally and vertically, and the extreme porosity of the rock of which it is composed, there are no springs, streams, or lakes of fresh water in the islands. The rain that falls, where it is not collected in artificial tanks, soaks down into the porous rock until it mingles near the level of the sea with the salt water with which the lower parts of the rock are saturated. The water in the ponds and marshes, which occupy considerable areas in the less elevated parts of the islands, is always brackish. The inhabitants depend for their supply of water chiefly on the collection of rain in tanks. These tanks are connected not only with the roofs of the houses, but with areas on the hillsides scraped smooth for that purpose.

The chain of islands is bordered on the south-east by a fringing reef, distant perhaps a quarter of a mile on the average from the shore. On the north side of the ellipse the line of the reef is nearly continuous; but the only dry land is the little islet, or group of islets, the largest of which, called North Rock, is about 8 feet in diameter and about 14 feet in height.

Along the course of the reef are numerous rings of calcareous rock, a few feet or yards in diameter, rising to a level of about 2 feet above low-tide level. The crest of these circular ridges is formed in large part of the calcareous tubes of tubicolous worms. They are appropriately called by Nelson "serpuline reefs."[*] The elevation of these serpuline reefs above low-tide level is due to the fact that these worms, unlike the coral-forming anthozoa and hydrozoa, can survive an exposure for some hours out of water. There are circular ridges of coral reef similar to these serpuline reefs, except that they are less elevated, their upward growth being limited by the inability of the coral animals to survive an exposure above the water. These circular reefs are called, commonly, "boilers." The form of both varieties of these "boilers" illustrates well Chamisso's theory of atolls—a theory which, though inadequate for the explanation of atolls in general, recognized a principle which has played an important part in the history of coral formations.[†]

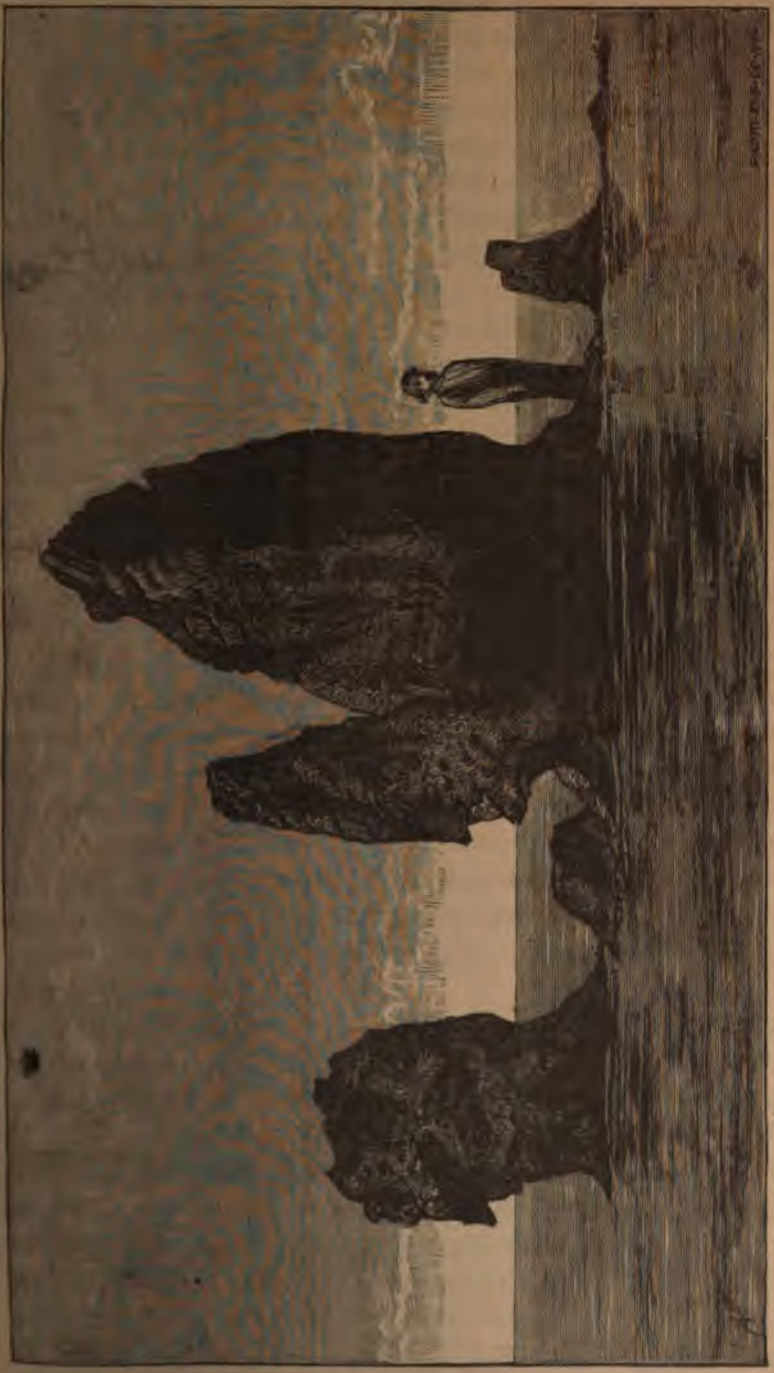
The depth of water in the elliptical lagoon inclosed by the outer reef is generally 6 or 8 fathoms, though there are many patches of reef scattered through the lagoon. Outside of the reef the water deepens gradually for a mile or more, the average depth at the distance of a mile being only about 12 fathoms. A little further from the shore a more abrupt descent commences, the depth at a distance of 10 miles in every direction except the south-west being from 1,500 to 2,250 fathoms. "Twenty miles to the southwest-by-west from the Bermudas there are two submerged banks, 20 to 47 fathoms under water, showing that the Bermudas are not completely alone, and demonstrating that they cover a summit in a range of heights."[‡] The Challenger expedition obtained a sounding of 2,950 fathoms about 300 miles further on in the same direction, indicating apparently that the range is not of great extent in that direction.[§]

IS BERMUDA AN ATOLL?

The general form of the Bermuda Archipelago, as represented on a map, is strikingly suggestive of the belief that it is a compound atoll, similar to Mahlos Mahdoo and some other atolls of the Maldiva Archipelago. The great depth of water within a few miles of the islands, and the exclusively calcareous character of the rocks of which the islands are composed, tend to confirm this impression. Dana[‖] and Thomson[¶] regard Bermuda as truly an atoll. Darwin apparently

---

[*] *Op. cit.*, pp. 105, 116.
[†] Darwin, Coral Reefs, pp. 78, 118.
[‡] Dana, Corals and Coral Islands, p. 370.
[§] Thomson, *op. cit.*, Vol. I., p. 286.
[‖] Corals and Coral Islands, p. 218.
[¶] *Op. cit.*, Vol. I., p. 280.



NORTH ROCK, BERMUDA.—(From a photograph by J. R. Heyl, of Hamilton, Bermuda.)

inclines to the belief that it is not an atoll, and calls attention to the following points in which Bermuda differs from atolls in general: "First, in the margin of the reef not forming a flat, solid surface, which is laid bare at low water; secondly, in the water gradually shoaling for nearly a mile and a half in width round the entire reef; and, thirdly, in the size, height, and extraordinary form of the islands, which present little resemblance to the long, narrow, simple islets, seldom exceeding half a mile in breadth, which surmount the annular reefs of almost all the atolls in the Indian and Pacific Oceans."* These differences are certainly of great importance; yet I believe that they are all capable of explanation on the theory that Bermuda is an atoll. I believe we may recognize the causes of these peculiarities in the peculiar history of the islands. Bermuda has a special interest in view of its position. It is perhaps the only atoll in the Atlantic Ocean, the atoll character of the Bahamas being at least doubtful.† Bermuda is also remarkable as being more remote from the equator than any other coral formation, the growth of corals there being rendered possible by the influence of the Gulf Stream.

THE CORAL LIMESTONE AND ITS VARIETIES.

As already stated, the only rock found *in situ* in Bermuda, if we except the peat or muck of the bogs, and the "red earth," which will be specially treated of hereafter, is limestone. The rock varies, however, exceedingly in texture. The extremes are an unconsolidated, calcareous sand, a subcrystalline rock of almost flinty compactness, and a coarsely crystalline stalagmite. The hard, compact rock is locally called "base rock," and the name is employed in that sense by Nelson;‡ but it does not uniformly underlie the softer rocks, nor is there any evidence that it is older than they.

Dana distinguishes in coral reefs and islands three kinds of rock in respect of the mode of formation: viz., reef-rock, beach sand-rock, and drift sand-rock.§ The reef-rock is that which constitutes the reefs proper. It is formed by the accumulation of the more or less finely comminuted material of the corals, shells, and other skeletons of marine animals, on the grounds where the corals are growing. It can therefore never be formed at an elevation much above low-tide. The beach sand-rock is formed by the action of the waves sweeping up against the shore the calcareous sands resulting from the disintegration of shells and corals, precisely as in other places the waves sweep up the silicious sands of an ordinary beach. The beach sand-rock is therefore formed exactly between the levels of low and high tide, though the action of storms may cause it to extend somewhat above the ordinary high-tide level. The drift sand-rock is formed by the action of winds seizing the dry sand at the upper margin of the beach and transporting it further inland and to greater elevations. The drift sand-rock may therefore be formed at any level, from that of high-tide upward. The cement which converts all these fragmental deposits into solid rock is formed by the solution of the calcareous particles themselves.

---

* Coral Reefs, p. 264.

† Darwin, Coral Reefs, pp. 256–259; Dana, Corals and Coral Islands, pp. 213–218.

‡ *Op. cit.*, p. 109.

§ Corals and Coral Islands, Ch. II.

A most important step in the investigation of the history of a coral island is the recognition of the respective distribution of these three kinds of rock. The discrimination of the true reef-rock from the sand-rocks is not usually a difficult task. The reef-rock, whether fossiliferous or not, is usually readily distinguishable by the impalpable compactness of parts of the mass, resulting from the consolidation of the finely triturated coral mud; while the sand-rocks, even when appearing quite compact, will almost invariably reveal on closer examination their arenaceous texture.

The discrimination of the two kinds of sand-rock from each other is much more difficult. Indeed, no absolute criteria exist for the discrimination of beach-rock and drift-rock, though serviceable indications may be obtained from the texture, lamination, and fossil contents of the rocks. The beach-rock is, on the average, of coarser grain than the drift-rock, as the wind sweeps along chiefly the finer sands; but some specimens of the drift-rock are coarser than some specimens of the beach-rock. The beach-rock is, on the average, more perfectly consolidated than the drift-rock, but in this character also both rocks vary widely. Drift-rock, when submerged by a subsidence subsequent to its deposition, may come to assume the degree of consolidation usually observed in beach-rock. On the south shore of the Main Island, near Spanish Rock, I observed strata perfectly continuous dipping towards the water, exceedingly hard at the margin of the water, but becoming considerably softer as they were traced upward and landward. Mr. Ebenezer Bell, who some years ago had charge of some works in progress on Boaz Island, informed me that he found that rock so soft as to cru [illegible] e's fingers became quite hard on immersion for a week or [illegible] sea-water. Some of the hardest rock which I observed in

Bermuda was shown by other characters to be unmistakably drift-rock A more reliable distinction is found in the lamination, the beach-rock showing a gentle and tolerably uniform dip towards the water, while the drift-rock shows the high and extremely irregular dips which are characteristic of wind-blown sands. But not every section exhibits characters sufficiently marked to settle the nature of the rock, since the beach-structure admits of a considerable degree of irregularity in dip, while wind-blown sands in a long ridge or dune may have for long distances a gentle and nearly uniform dip. The indication furnished by the fossil contents of the rocks is important. The beach-rock is often richly fossiliferous, containing shells and pieces of coral of considerable size. The drift-rock can, of course, ordinarily contain no relics of marine animals except fragments so small as to be blown by the wind. A high wind can, however, sweep along pieces of shell and coral larger and heavier than one would at first suppose. The flat, thin valves of lamellibranchs are more likely to occur in drift-rock than shells of gasteropoda. In the recent sand-drifts at Tucker's Town I collected a number of organic relics, thinking they might afford some indication as to the limit of size of marine fossils likely to occur in the drift-rock. Among them were a fragment of the shell of Spondylus weighing 1.8 grammes; a valve of Chama, incrusted with tubes of Serpula, weighing 2.7 grammes; and a fragment of the coral Mycedium, having a length of 45 millimeters and a breadth of 30 millimeters, and weighing 8.3 grammes. Of most frequent occurrence in the drift-rock of Bermuda is the large and heavy shell of Livona pica. This seems at first sight utterly paradoxical, as the shell is altogether too large to be moved by the wind. The true explanation is undoubtedly that given by Nelson, who states that he has on more than one occasion seen soldier-crabs running about in these shells.* While the presence of marine fossils in a sand-rock is an indication that it is a beach-rock, the drift-rock is quite apt to contain the shells of land snails. The presence of snail-shells cannot, however, be regarded as a sure proof of drift-rock, since they might easily be washed down by rains from a bank or bluff above the beach, and imbedded in the beach sands.

That there can be no absolute distinction between beach-rock and drift-rock will be manifest from the consideration that the two formations are in their origin strictly continuous. Near Elbow Bay and at Tucker's Town, sand-hills are now in process of formation. At the former locality the advancing dune has nearly buried two small houses, and is encroaching upon cultivated grounds. Nelson* gives us an account of the beginning of this invasion, and Thomson† describes the present condition of the dune. At these localities there is an opportunity to study the mode of formation of the two kinds of rock, and to observe the perfect continuity of the two formations. As the wind reaches the sand on the upper and drier part of the beach, and moves it landward, the beach merges above, with no perceptible line of demarcation, into the base of the sand-hills. But though, in the nature of the case, there can be no absolute distinction between beach-[illegible] rock, it is practicable, by noting all the indications of [illegible] lamination, and fossil contents, to decide in most cases with [illegible] whether the rock exposed in a particular section is beach-[illegible] rock.

---

* *Op. cit.*, p. 112.

[illegible] rock in Bermuda *in situ* above the water-level. Nel-[illegible] blocks of coral reef imbedded in the rock on the south [illegible] Island.‡ I observed detached blocks of reef-rock on [illegible] Point, but none *in situ*. In the statement, "Toward [illegible] reef rock outcrops,"§ Dana is apparently misled, in [illegible] one who has not visited the locality, by a state-[illegible] The rock described in Dana's quotation from Nelson [illegible] compact limestone, in which scarcely a [illegible] is to be seen,"‖ shows on careful examina-[illegible] though consolidated by percolating waters [illegible] exhibits traces of irregular lamination, [illegible] land snails. It is unquestionably an [illegible] found at several localities and at [illegible]

[illegible] along the shore of the isl-and [illegible] Bermuda limestone is entirely an [illegible] I have never observed [illegible] altitude of more than about [illegible] category of beach-rock may [illegible] described by Nelson** [illegible] across the mouth of [illegible] reaches an elevation of [illegible] horizontal lamination contrasts strongly with the high dips observable in the drift-rock on the Main Island in the vicinity of Hamilton. Near the south end of Ireland Island I observed a stratum of almost perfectly unconsolidated sand abounding in shells. In the lower layers of this sand the shells are of marine species. In the uppermost layer the shells are those of land snails. The stratum is overlain by ordinary drift-rock. The layers containing marine shells attain an elevation of about 15 feet above the water. In spite of the lack of consolidation of this stratum, I can hardly doubt that its lower layers are truly a beach fórmation, and that the transition from marine to terrestrial fossils marks an epoch of elevation. A conglomerate evidently of beach origin appears at Stock's Point, the part which remains *in situ* on the north shore of the Point reaching an elevation of about 12 feet; though Mr. J. T. Bartram, an enthusiastic self-taught naturalist residing near the spot, assured me that, in a part of the bluff which has been removed in quarrying, the conglomerate attained a considerably greater altitude. Unquestionable beach-rock appears on the north shore of St. George's near Fort Catherine. The rock is at that locality richly fossiliferous. But the most instructive localities of the beach-rock which I have observed are along the south shore of the Main Island. At various points along that shore the beach-rock, more or less fossiliferous, with its characteristic gentle dip seaward, forms a gently sloping platform, at the back of which rises a low cliff of drift-rock with steep landward dips. The most thoroughly satisfactory locality which I observed for the exhibition of the relations of the two rocks is near Devonshire Bay. There the beach-rock, which forms (as in other localities along the south shore) a platform gently sloping seaward, is in places fine-grained and very hard, in other places fossiliferous with shells and pieces of coral of considerable size. It is surmounted by the usual low cliff of drift-rock with high landward dips. Overlying the hard beach-rock of the shore platform, and underlying the drift-rock of the cliff, is a stratum of unconsolidated sand, resembling that observed at Ireland Island, containing marine shells in its lower layers and land shells in its uppermost layer. This stratum of sand is mentioned by Nelson,* though he seems to have misapprehended the character and relations of the fossiliferous beach-rock which underlies the sand stratum. The sand stratum is not recognizable at some of the localities on the south shore where the phenomena are in other respects as above described.

---

* [illegible] 91

† [illegible] Islands, p. 220.

‡ [illegible] p. 111.

---

* *Op. cit.*, p. 107.

All the rock in the interior of the islands, and all the rock which is much elevated above the water level, is drift-rock. Indeed, substantially the whole mass of the rock visible in the islands is drift-rock. Probably along the greater part of the shore drift-rock comes down to the water's edge, no other rock being visible. I was not able to examine the whole of the coast, but I am confident that drift-rock comes down to the water's edge along the north shore of the Main Island from Spanish Point to the Flats and beyond, along a part at least of the north shore of St. George's, around a considerable part, if not the whole, of the circuit of Harrington Sound and Castle Harbor, around the head of Hamilton Harbor, and in many places even along the south shore of the Main Island—the region of the coast in which the beach-rock is best exhibited. North Rock, at least in its upper part, is formed of drift-rock, as is shown by the high dip of its lamination.* This character of the rock is well shown in the beautiful photograph taken by Mr. J. R. Heyl, of Hamilton. The drift-rock is usually very soft, so that it is quarried out for building purposes by means of a peculiar long-handled chisel, in large blocks, which are readily sawn into pieces of such size and shape as may be wanted. Most of the houses in Bermuda are built of this exceedingly friable stone. Even the roofs are covered with the same material sawn into thin slabs. This stone, covered with a coat of whitewash, is sufficiently durable for ordinary buildings in the Bermudian climate. Exposed to the frosts of a New England winter, it would of course crumble very rapidly. Although the drift-rock is generally quite soft and friable, it is sometimes very firmly consolidated and of a subcrystalline texture. This hard rock is quarried like any ancient limestone or marble, and has been used in the construction of the fortifications and other government works. The quarries at Paynter's Vale and on Ireland Island are in such a hard drift-rock. The quarry of the Royal Engineers, near Elbow Bay, appears to be in beach-rock. It would be a curious question, what are the precise conditions which have determined the varying action of the rains on these accumulations of coral sand. While in some localities the sands have been merely washed away and dissolved, in others the grains have been, by the action of the same rains, cemented firmly together, until the rock has assumed a sub-stalagmitic texture, as at Paynter's Vale.

The usual softness of this drift-rock has made it a matter of small labor and expense to secure easy grades on most of the roads in the

---

* Thomson, *op. cit.*, Vol. I., p. 296.

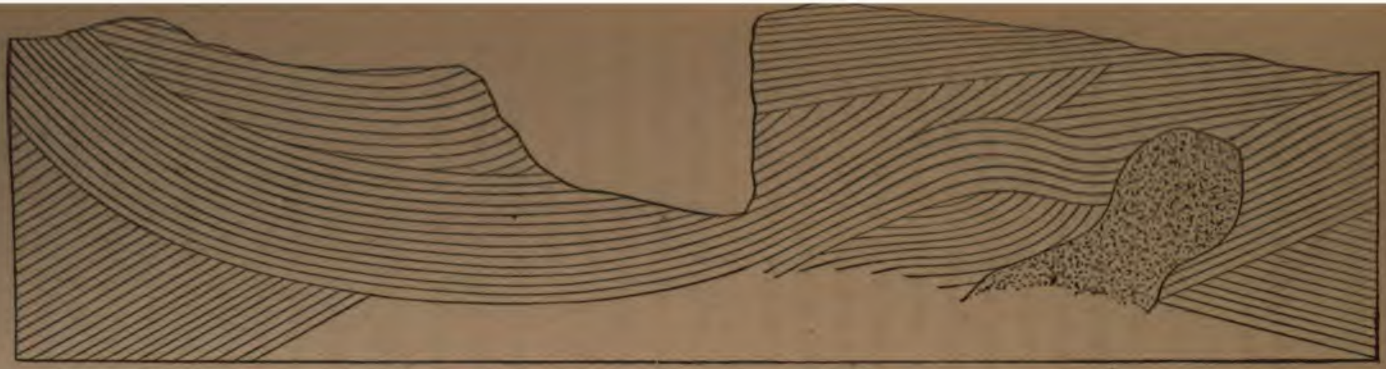


FIG. 1. Section near TRINITY CHURCH, Hamilton, Bermuda.

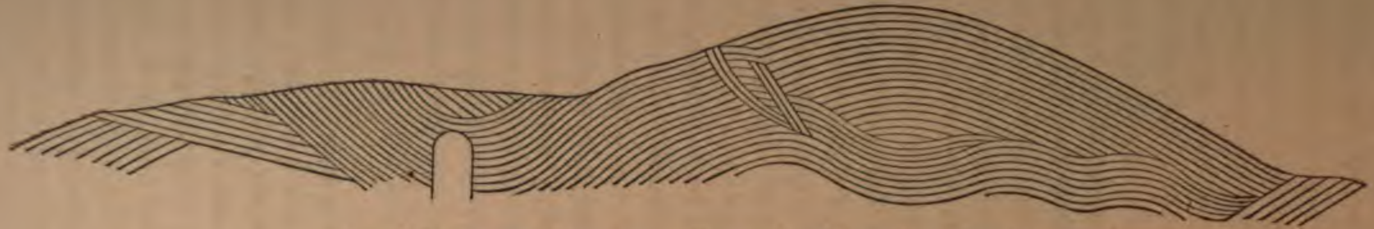


FIG. 2. Section near GOVERNMENT HOUSE, Mount Langton, Bermuda.

islands, by making quite deep cuts wherever they are required. These cuttings are of great interest to the geologist, from the beautiful illustrations which they afford of that extreme irregularity of lamination which is characteristic of wind-drifts. Not only the country roads, but also the streets of the towns abound in these beautiful and instructive sections. Fine exhibitions of this same structure are to be seen in the natural sections afforded by the cliffs and pinnacles of the shore. The characteristic structure of the drift-rock is shown in plates III and IV.

The height of these accumulations of wind-blown sands is certainly remarkable. The highest hills on the islands attain an altitude of about 250 feet; and, since no rock of marine formation has been observed at an elevation of more than about 15 feet, it is evident that nearly the whole elevation of these hills must be due to the accumulated sand-drifts. Sand-drifts, however, of such extraordinary altitudes, though exceptional, are by no means unparalleled. Prof. W. C. Kerr, State Geologist of North Carolina, informs me that sand-hills more than 100 feet in height occur along the coast of that State. Dunes of even greater altitude than those in Bermuda occur on the coast of Gascony and near Cape Verd.*

In one respect, it seems to me, calcareous sands are better adapted than silicious ones for the formation of hills of great height: viz., the comparative solubility of the material, producing a more rapid consolidation by the cementing of the grains. At times when the direction of the wind is unfavorable to the increase of a sand-hill, in a region of variable winds, the tendency will be to reduce the height by removal of the sands from the summit. If the sand has already become partly consolidated, the loss from this cause will be much lessened.

MOVEMENTS OF ELEVATION AND SUBSIDENCE.

The facts which have been already detailed in regard to the distribution of the various kinds of rock, and other facts which will presently be referred to, afford clear evidence as to changes of level which the islands have undergone. The occurrence of beach-rock above the water-level, as noticed at several localities, is of course unquestionable proof of elevation. Proofs of subsidence are equally clear. The relation of the beach-rock and drift-rock at Devonshire Bay and various other localities along the south shore is evidence of subsidence. The cliff of drift-rock which in these localities rises immediately back of the narrow platform of beach-rock, is shown by its steep landward dip to be the landward side of a dune, whose seaward slope has been removed by erosion. The dip of the laminæ of sand on the seaward face of a dune is, of course, seaward. If we conceive the seaward face of the dune to be restored, it would certainly in some localities extend beyond the narrow shore platform into the area now covered by the sea. It is evident, then, that the drift-rock of these cliffs on the south shore was formed at a time when the islands stood at a higher level than at present. It is easy to see the reason why the exposures of beach-rock should be much more frequent and extensive on the south shore than on the north, in the fact of the vastly greater erosive action of the sea on the south shore. The south shore receives the full dash of the waves of the Atlantic, while the north shore is acted upon only by the lighter waves raised in the great lagoon between the shore and the north reef. Another proof of subsidence is seen in the occurrence of caves with floors of stalagmite below the water level, and with stalactites whose tips are immersed in the sea-water.* About the year 1870 "submarine blastings were carried on at the entrance of Hamilton Harbor, and at a depth of over 6 fathoms a cavern was broken into which contained stalactites and red earth."† In the excavations made somewhat later for the lodgment of the immense floating dock at the Dockyard on Ireland Island, 46 feet below the water-level was found a stratum of "red earth," 2 feet in thickness, containing remains of cedar trees. This stratum was underlain by a stratum, 4 feet thick, of hard calcareous sand-rock, containing land snails. J. Matthew Jones has called attention to the fact that an elevation equal to the subsidence indicated by the phenomena observed in the excavations at the Dockyard would lay bare the whole elliptical area inclosed by the outer reef.‡

---

* The Ocean, Atmosphere, and Life. By Élisée Reclus. New York, 1873. p. 195.

The series of movements required to account for the main features of Bermudian geology seems to be the following: 1. A subsidence, in which the original nucleus of the islands disappeared beneath the sea, the characteristic atoll form was produced, and the now elevated beach-rock was deposited. 2. An elevation, in which the great lagoon and the various minor lagoons were converted into dry land, and the vast accumulations of wind-blown sand were formed, which now constitute the most striking peculiarity of the islands. 3. A subsidence, in which

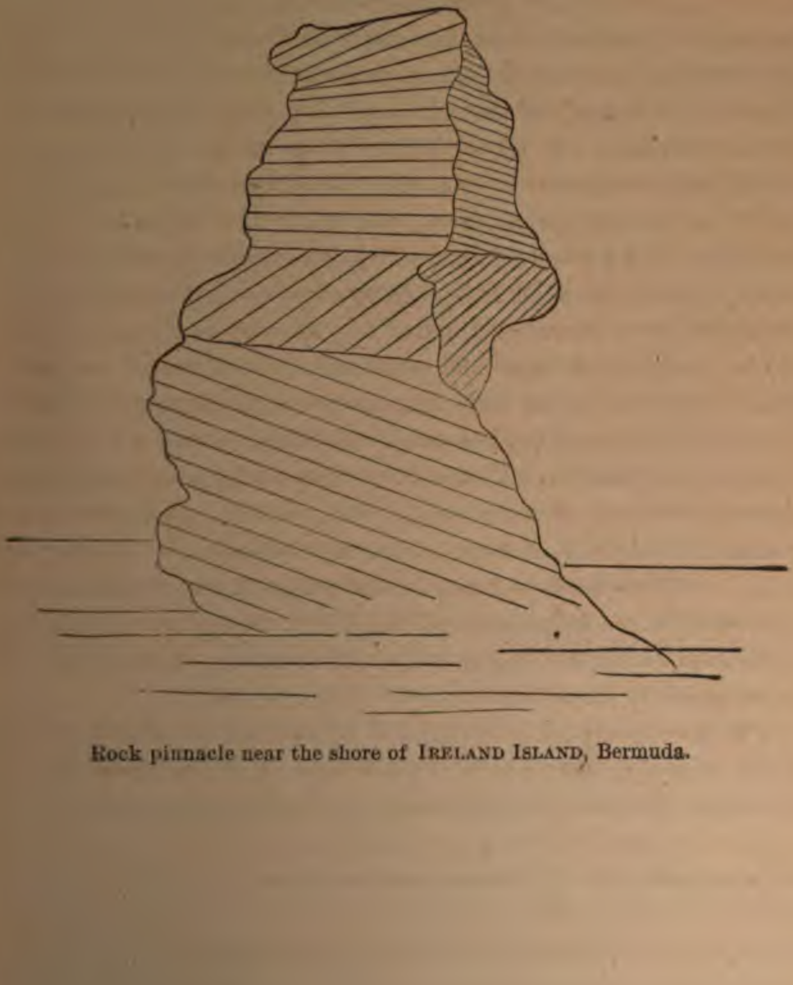
---

* An elegant description of one of these beautiful caverns may be found in Thomson, op. cit., Vol. I., pp. 304, 305.

† Jones, Recent Observations in the Bermudas: in Nature, Vol. VI., p. [illegible]

‡ Recent Observations in the Bermudas.

PLATE IV.



Rock pinnacle near the shore of IRELAND ISLAND, Bermuda.

the soft drift-rock around the shores suffered extensive marine erosion, and the shore platform and cliffs already described were formed.

On this hypothesis, the peculiarities of Bermuda mentioned by Darwin as rendering its atoll character at least doubtful,[*] admit of ready explanation. The absence of the usual horizontal reef-platform, and the gradual shoaling of the water for a mile or more around the islands, may be accounted for by the supposition that the last subsidence was too rapid and too recent to allow the growth of the reef into its usual and typical form.[†] The original atoll character has, indeed, been greatly modified by the subsequent changes; and the gradually sloping bottom for some distance from the shore presents, instead of the typical horizontal reef-platform, a plane of marine denudation formed by the rapid erosion of the soft calcareous sand-rock during the progressive subsidence. Dana has shown that a subsidence too rapid for the growth of the reef to keep pace with it may lead to the formation of narrow fringing reefs, producing thus an effect which may counterfeit the effects of elevation.[‡] Darwin is inclined to regard the fringing reefs on the south shore of Bermuda as evidence of recent elevation;[§] but I believe all the facts taken together are far more satisfactorily explained on the hypothesis that the latest movement has been one of subsidence. The extraordinary size and elevation of Bermuda, as compared with other atolls, is accounted for by the vast accumulation of drift-sand during a period of elevation. Darwin, indeed, admits that the probable Æolian formation of most of the Bermudian rock renders the unusual height of the islands immaterial as an objection to their atoll character.[||]

The difference in the amount of dry land between the northern and southern sides of the ellipse is doubtless due, as suggested by Dana,[¶] in part to the prevailing southerly winds, the windward side of the atoll being the more favorable both for the growth of the reef proper and for the accumulation of beach and drift sand-rock; and partly to differences in the configuration of the lands around which the reefs were formed.

It is a profound and comprehensive suggestion of Professor Dana that the great oceanic subsidence recorded by the coral islands of tropical seas was the counterpart of the great elevation of the continental lands in the Glacial Period.[*] It is not improbably a legitimate following out of this suggestion to recognize, in the three great movements which are indicated for at least a part of the North Atlantic basin by the geological phenomena of Bermuda, the counterparts of the three great movements of the North American continent which have characterized in American geology the epochs of the Quaternary Age. The great subsidence in which the Bermudian atoll was formed, would then be recognized as correlative with the Glacial elevation of the continent. The epoch of elevation in which the Bermudian lagoon was converted into dry land, would correspond with the Champlain subsidence of the continent. And the final subsidence, of which Bermudian geology affords evidence so manifold, would correspond with the re-elevation of the continent which marked the transition to the Terrace or Recent Epoch.

---

[*] Coral Reefs, p. 264.

[†] For estimates illustrative of the extreme slowness of the growth of coral reefs, see Dana, Corals and Coral Islands, pp. 249-254.

[‡] Notes on the new edition of Mr. Darwin's work on the Structure and Distribution of Coral Reefs: in Nature, Vol. X., pp. 408, 409.

[§] Coral Reefs, p. 265.

[||] Coral Reefs, p. 265.

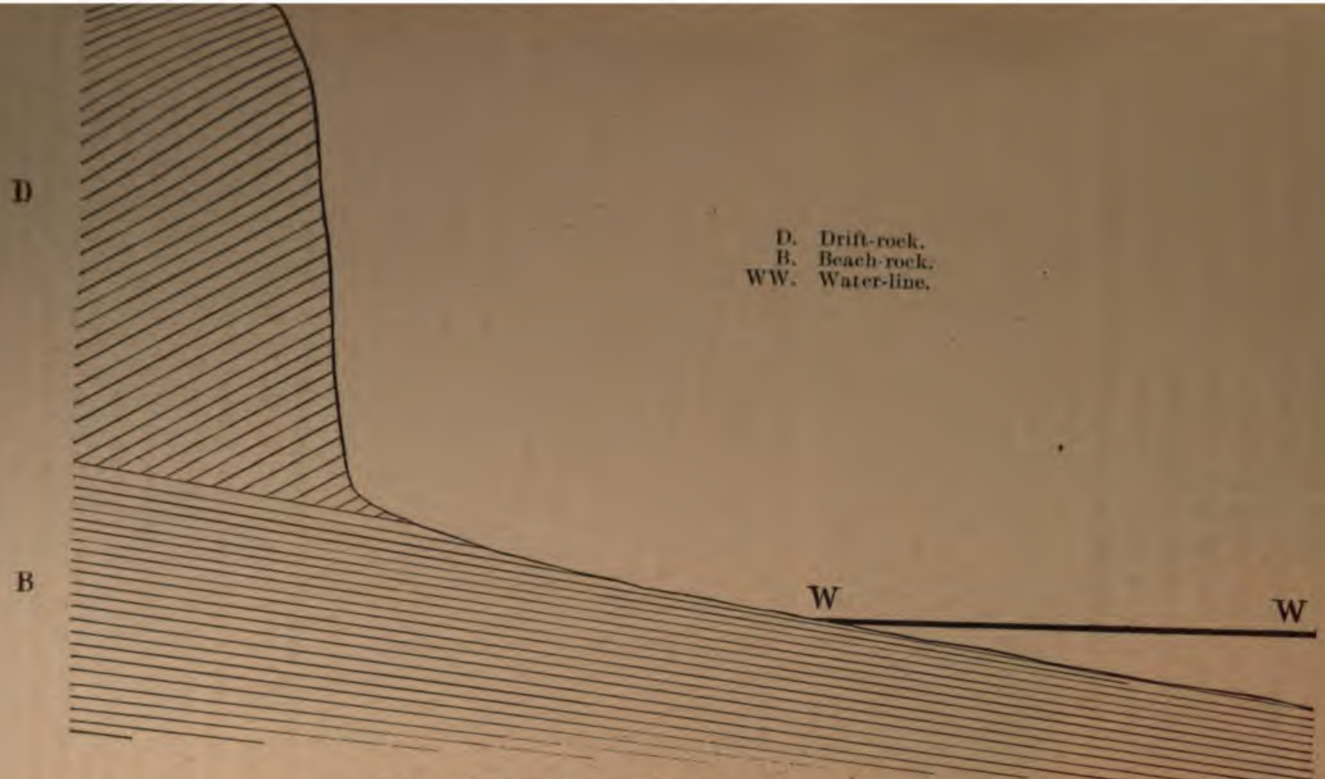
[¶] Corals and Coral Islands, p. 221.

While we may reasonably conclude that Bermuda, in common doubtless with an area of the North Atlantic of very considerable extent, has undergone these comprehensive movements, it would be strange if there had not occurred at least locally minor oscillations. Such oscillations may possibly be indicated by the stones reported by Nelson as occurring in the layers of "red earth" in Ireland Island.[†] His statement, however, is somewhat indefinite. At one locality on the south shore, a short distance west of Tucker's Town, I observed a hard layer of rock containing marine shells immediately overlying a soft layer containing land shells. The clearest evidence, however, of repeated oscillations of level is afforded by a remarkable locality on the north shore of Stock's Point. The rock which has been quarried there, and which now appears in the base of the bluff, is a very hard rock of subcrystalline texture and of ferruginous color. It shows vestiges of irregular lamination, and contains fossil Helices and no marine fossils. It is undoubtedly a drift-rock, like that at Paynter's Vale. The upper surface of this rock is exceedingly irregular, giving evidence of much subaerial erosion preceding the deposition of the overlying strata. It is overlain by a remarkable conglomerate, evidently a beach-rock, containing fragments of the underlying laminated drift-rock, peculiar ferruginous nodules, compact lumps of "red earth," and pretty large marine

---

[*] Corals and Coral Islands, pp. [illegible].

[†] Op. cit., p. 118.



Section illustrating relation of beach-rock and drift-rock.

is nothing more remarkable in this narrative than the statement that they made account at the first that they were cast away hard by the shore, being high cliffs, whereas they found themselves seven leagues off. It is a positive proof that the north-west reefs, only a few points of which are now above water at the lowest spring tide, were then some feet above it. The expression high cliffs must be interpreted by the circumstance of seamen in a small boat approaching a dangerous shore, with a heavy swell on, rendering it dangerous and difficult to land. But if they were only 10 feet high, the amount of subsidence in less than three centuries, shown by their present submergence, is a most significant geological fact; and Henry May has rendered an invaluable service by mentioning the circumstance. The map in Purchas, published 1625, confirms it. It shows three distinct islets, that have now disappeared, along the line of the northern reefs. The North Rock of Bermuda, 14 feet high, and some smaller rocks near it, are all that remain to attest the accuracy of these early descriptions." The statements of May appear to me rather to warrant exactly the contrary inference. If the northern reef formed then a line of cliff nearly or quite continuous, I am unable to understand how he could have supposed himself hard by the shore when really several leagues from it. But, on the supposition that the vessel struck near some islet or group of islets like North Rock, the account becomes perfectly intelligible. The rocky islet could easily have been mistaken in the storm for a line of cliff, and the mistake would speedily become obvious on starting to row to the supposed shore. The 7 leagues of distance is, of course, the exaggerated estimate of men who were rowing a heavy-laden boat, with a raft in tow, on a stormy sea. That there may have been several islets scattered along the line of the north reef, which have now succumbed to the action of the waves, is on all accounts exceedingly probable. May's statement that the island is divided into broken islands, and his estimate of the dimensions of the island on which he found himself, and which he supposed to be the principal one of the group, though the description is not sufficiently definite to afford any very reliable conclusions, certainly favor the belief that the land was then not appreciably higher than at present. An elevation which would convert the north reef into a continuous line of cliff, would very seriously modify the broken character of the southern side of the atoll, connecting most of the islets by continuous dry land.

The last notice supposed to indicate a subsidence within historic [illegible] from John Smith's History of Virginia.[*] In an enumeration of the birds found in Bermuda occurs the expression: "Very many of them since the plantation are killed, the rest fly or seldom come but to the most uninhabited places, from whence they are observed to take their flight about sunset, directing their course towards the north-west, which makes many conjecture there are some more islands not far off that way."[†] The statement is too indefinite to admit any very positive conclusions. If we accept it as indicating the existence of some dry land in the position of the north reef, it may perhaps be sufficiently accounted for by the supposition already suggested: namely, that there may have been a number of small islets which have since been degraded to the water-level by the erosion of the waves. Certainly the statement does not justify a belief in the recent subsidence of the islands, in opposition to the evidence now to be presented.

The earliest descriptions of Bermuda which are sufficiently accurate and detailed to admit of intelligent comparison with the present condition of the islands, date from the time of the shipwreck of Sir Thomas Gates and Sir George Somers in 1609. The following extracts from these descriptions will show that at that time the size and form of the islands and the depth of water within the reef were essentially the same as at present. The statement of the depth of the water seems to me perfectly conclusive against the theory of any considerable subsidence within the last three centuries.

The first of these extracts is from the narrative of William Strachy.[‡] "The Bermudas bee broken Ilands, fiue hundred of them in manner of an Archipelagus (at least if you may call them all Ilands that lie, how little soeuer into the sea, and by themselues) of small compasse, some larger yet then other, as time and the Sea hath wonne from them, and eaten his passage through, and all now lying in the figure of a Croissant, within the circuit of sixe or seuen leagues at the most, albeit at first it is said of them that they were thirteene or fourteene leagues; and more in longitude as I haue heard. For no greater distance is it from the Northwest point to Gates his Bay, as by this Map your Ladyship may see, in which Sir George Summers, who coasted in his boat about them all, tooke great care to expresse the same exactly and full, and made his draught perfect for all good occasions, and the benefit of such, who either in distresse might be brought upon them, or make saile this way. It should seeme by the testimony of Gonzalus Ferdinandus Oviedus, in his Booke intituled, The Summary or Abridgement of his generall History of the West Indies, written to the Emperor Charles the Fift, that they haue been indeed of greater compasse (and I easily beleeue it) than they are now, who thus saith [here follows the extract from Oviedo, as above given, except that, by a mistake of copyist or printer, the breadth of the group is given as sixteen leagues, instead of six]. True it is, the maine Iland, or greatest of them now, may be some sixteene miles in length East North-East, and West South-West the longest part of it, standing in thirtie two degrees and twentie minutes, in which is a great Bay on the North side, in the North-west end, and many broken Ilands in that Sound or Bay, and a little round Iland at the South-west end."[*]

---

[*] The General History of Virginia, New England, and the Summer Isles. By Capt. John Smith. London, 1624. The work is reprinted in A General Collection of Voyages and Travels in all parts of the World. By John Pinkerton. London, 1808–14. Vol. XIII, pp. [illegible]

[†] Pinkerton, op. cit., Vol. XIII, p. 173.

[‡] A true repertory of the Wracke, and redemption of Sir Thomas Gates Knight; upon, and from the Ilands of the Bermudas: * * * written by William Strachy, Esquire [illegible] is contained in Purchas, Part 4, pp. 1734–58. Copious ex- [illegible] Lefroy, op. cit., Vol. I, pp. 22–54.

The second extract is from the narrative of another member of the expedition.[†] "This Iland, I meane the maine Iland, with all the broken Ilands adiacent, are made in the forme of a halfe Moone, but a little more rounder, and divided into many broken Ilands, and there are many good harbors in it, but we could find but one especiall place to goe in, or rather to goe out from it, which was not altogether free from some Danger, there there is three Fathoms water at the entrance thereof, but within, six, seauen, or eight Fathoms at the least, where you may safely lie Land-locked, from the daunger of all Winds and Weathers, and moore to the trees."[‡]

To me these descriptions appear to justify a very positive conclusion that there has been no considerable subsidence since 1609; and, of course, all geological probabilities are against so rapid a subsidence as would be required to convert the north side of the atoll from a high cliff to a sunken reef in the interval between May's shipwreck in 1593 and Somers' in 1609, or to diminish considerably the area of the archipelago in the century succeeding Oviedo's voyage in 1515. A conclusion so improbable is certainly not to be adopted on evidence so indefinite or ambiguous as has been gathered from the narratives of Oviedo and May. The belief that the level of the islands in the time of John Smith was higher than at present is utterly out of the question. The opinion advocated in this paper finds additional confirmation in the Map by Richard Norwood, in 1663.* That map is an accurate delineation of the islands in their present condition, and renders it certain that within the last two hundred years no considerable subsidence has taken place.

---

[*] Purchas, *op. cit.*, Part 4, p. 1738.

[†] A discovery of the Barmudas, otherwise called the Ile of Divels, by Sir Thomas Gates, Sir George Sommers, and Captayne Newport, with Diuers others. Sil. Jourdan. A reprint of this narrative bears the title: A plaine Description of the Barmudas, now called Sommer Ilands. With the manner of their Discouerie Anno 1609, by the shipwrack and admirable deliuerance of Sir Thomas Gates, and Sir George Sommers. London, 1613. Haklnyt, *op. cit.*, Vol. V., pp. 551–8. Tracts and other papers relating principally to the Origin, Settlement, and Progress of the Colonies in North America. Collected by Peter Force. Vol. III., No. 3. Lefroy, *op. cit.*, Vol. I., pp. 14–21.

[‡] Hakluyt, *op. cit.*, Vol. V., p. 557. Force, *op. cit.*, Vol. III., No. 3, pp. 13, 14.

EROSION.

One of the most interesting incidental subjects of study for a geologist in Bermuda is the immense erosion which has taken place. The softness of most of the drift-rock, and the solubility of calcium carbonate in rain-water, combine to produce an exceedingly rapid erosion, even though the powerful agency of frost is wanting. Many of the most picturesque features of Bermudian scenery are due to this erosion. The shore cliffs in many localities are carved into the most picturesque pinnacles, in whose endless variety of form the eye may find perpetual delight. Another result of erosion is the formation of innumerable caves, ranging in size from exquisite miniature grottoes to extensive caverns. One of these beautiful miniature caves I observed at Paynter's Vale. It had been laid open by the removal of the stone in quarrying. Its horizontal diameter was about 5 feet, its height in the middle about 2 feet. Pygmy stalagmites rose from the floor, and pygmy stalactites depended from the roof. In the peripheral parts of the little cavern the stalactites and stalagmites united in many cases to form little columns. Many of the larger caves are of exceeding beauty; but it is unnecessary to give any detailed description of them, as the phenomena are of course those which occur in all limestone caverns. A curious feature which the traveler meets here and there in Bermuda is a deep hollow with walls nearly vertical, or in places even overhanging. One may be walking over a nearly level plain, and suddenly find himself on the edge of a precipice looking down into a

---

* The curious history of Norwood's Map is given in Lefroy, *op. cit.*, Vol. I., preface. A copy of the map itself faces p. 645 of Vol. II.

Rocks on the south shore of Bermuda.

deep and wide gulf. These hollows are simply caves whose roofs have been eroded by the mechanical and chemical action of water, until, too weak to support themselves, they have caved in. On the walls of these unroofed caves beautiful stalactites may be seen half enveloped with velvety mosses and feathery ferns—a strangely beautiful combination of the adornments of the underworld with those of the world of daylight. In other cases the process of erosion has continued still further, so that the sides of the cave, as well as the roof, have been entirely removed, and nothing is left to mark the site of the former cave but a floor of crystalline stalagmite. Near Walsingham on the Main Island, and near Mullet Bay on St. Georges, I observed considerable areas where the coarsely crystalline calcite forming the surface rock is unquestionably a stalagmite floor—the only memorial of a former cave.

THE "RED EARTH."

The so-called "red earth" bears striking testimony to the amount of erosion which the islands have undergone. The usual superficial soil of the islands is a clayey earth, sometimes of a deep brick-red color, sometimes showing various shades intermediate between this deep red and the white or cream-color of the underlying rock. The material is occasionally somewhat firmly consolidated, but usually quite soft and earthy. It varies much in depth, forming deep pockets in some places, while in other places the white rocks are bare. It often occurs in cracks and cavities in the rocks. Where any considerable thickness of the drift-rock is exposed in a section, as at the extensive quarries on Ireland Island, one or more layers of the same "red earth" may generally be observed extending nearly horizontally at intervals through the rock. Various unsatisfactory explanations of the origin and nature of this "red earth" have been given. Jones formerly believed it to be "composed of decayed vegetable matter";[*] and this is indeed the common opinion of the inhabitants of Bermuda. Nelson conjectured that it was largely derived from the excrements of bats and birds.[†] The true explanation of its origin is undoubtedly that given by Thomson, as follows: "The coral-sand, like the mass of skeletons of surface animals accumulated at the bottom of the ocean, does not consist of carbonate of lime alone. It contains about 1 per cent. of other inorganic substances, chiefly peroxide of iron and alumina, silica, and some earthy phosphates. Now these substances are to a very small degree soluble in water charged with carbonic acid; consequently, after the gradual removal of the lime, a certain sediment, a certain ash, as it were, is left behind. One per cent. seems a very small proportion, but we must remember that it represents one ton in every hundred tons of material removed by the action of water and of the atmosphere; and the evidences of denudation on a large scale are everywhere so marked, that, even were some portion of this 1 per cent. residue further altered and washed away, enough might still be left to account fully for the whole of the red earth."* Assuming the "red earth" to be the insoluble residue left by the solution of the major part of the calcium carbonate of the coral rocks, it should be observed that its materials doubtless have the same twofold origin which has been recognized in the case of the somewhat analogous red clays of the deeper parts of the ocean bottom.† They are doubtless in part derived from the minute quantity of noncalcareous mineral matter existing in the corals, shells, and other calcareous skeletons of marine animals and plants; in part from the decomposition of volcanic minerals, which are continually being transported in various ways to all oceanic islands. Analyses of samples of the "red earth" are quoted by Thomson‡ from a "Report from Professor Abel, F. R. S., to H. E. General Lefroy, C. B., F. R. S., on the Character and Composition of Samples of Soil from Bermudas."

---

[*] On the Geological Features of the Bermudas: in Proceedings and Transactions of the Nova Scotian Institute of Natural Science, Vol. I., Part IV., Art. II., 1867, p. 21.

[†] Dana, Corals and Coral Islands, p. 391. The citation is from a paper on the Bahamas, in Quarterly Journal of the Geological Society of London, 1853.

PHENOMENA RESULTING FROM UNEQUAL HARDENING OF THE LIMESTONE.

A number of interesting phenomena result from the unequal hardening of the sand-rock where vegetable stems or roots or other accidents have determined the location of channels for the percolating waters. On the weathered surface of cliffs and banks of the drift-rock may often be observed hard bodies somewhat projecting, consisting of a more firmly consolidated sand-rock, having the form of slender cylinders irregularly branching, the main trunks being generally nearly vertical. These stems may generally be seen to be tubular, and in the slender cavity may generally be found more or less of woody fiber. These bodies have much the form and aspect of the "branched bodies" observed by Darwin at King George's Sound on the south-west coast of Australia, and at the Cape of

---

* Thomson, *op. cit.*, Vol. I., pp. 294, 295.
† Thomson, *op. cit.*, Vol. I., pp. 215–218; Vol. II., pp. 255, 256.
‡ *Op. cit.*, Vol. I., pp. 325, 326.

Good Hope[*], though differing from them in some respects, particularly in the very general presence of woody fiber in the center. Darwin states that the "branched bodies" at King George's Sound have "the central parts filled either with friable calcareous matter, or with a substalagmitic variety; this central part is also frequently penetrated by linear crevices, sometimes, though rarely, containing a trace of woody matter." In the similar bodies found at the Cape of Good Hope, he says, the "centers are often filled with black carbonaceous matter." Darwin's theory of the origin of these bodies is that they were "formed by fine calcareous matter being washed into the casts or cavities left by the decay of branches and roots of thickets buried under drifted sand."[†] The more distinctly tubular character of the Bermudian specimens, and the very common presence of a core of woody matter, seem to point to a slightly different mode of formation; and I believe the true explanation of the origin of the Bermudian "branched bodies" is that given by Jones. He believes that they have been formed by percolating waters, which would naturally follow in their descent the channels formed by underground stems and roots, cementing the grains of sand into tubes of harder rock inclosing the stems and roots.[‡] Both theories assume the burial of the vegetation beneath drifted sand. But, while Darwin considers the bodies in question as casts formed after the decomposition of the stems and roots, Jones considers them as having been formed by the cementing of the sand around stems and roots as yet undecomposed. Closely analogous to these "branched bodies" is the sort of stalagmitic net-work formed in some localities around the roots and stems of smaller plants.

Essentially analogous, also, are probably the so-called "palmetto stumps." These have been described by Nelson,[§] Jones,[‖] and Thomson.[¶] They appear generally as shallow, cup-shaped or saucer-shaped cavities, a few inches in diameter, the rim somewhat elevated above the general surface of the ground, the bottom evenly rounded and pitted with small depressions. The surface of these cups is quite hard; and the rock beneath for some inches in depth, though less hard than the superficial crust, is more firmly consolidated than the surrounding rock. The objects accordingly appear, when the surrounding rock is removed by weathering or otherwise, as irregular cylinders. It has often been crudely supposed that these cylinders are petrifactions or casts of the trunks of the palmetto; but this is certainly erroneous. I believe, however, that this error is but a misconception of the truth. The base of the palmetto stem is convex, with numerous small roots radiating from its surface. Its form is the counterpart of the shallow cup, pitted with little depressions, which is the characteristic feature of the bodies in question. The true explanation of the formation of these bodies appears to be simply this: the rain-water trickles down around the convex base of the palmetto stem, and thence follows the little radiating roots. As in the other cases already discussed, the course of the waters is marked by a more perfect cementing of the grains of calcareous sand, giving the rock in those parts a sub-stalagmitic character. When the tree finally dies, and drops out of its socket, there is left a saucer-shaped cavity, lined by a sub-stalagmitic crust, and an irregular cylinder of somewhat hardened rock beneath it. Sir Wyville Thomson combats the idea of the organic origin of these bodies, and calls attention to the frequent irregularity of their form. He tells us that a perfect series of gradations may be traced from the regular circular form ("the most characteristic, and probably by far the most common")* to forms so irregular that their organic origin is entirely out of the question. Now in maintaining that the common and typical sort of these bodies are produced by the rain-waters following the course determined for them by the stem of the palmetto, I by no means deny that by accidents of a totally different sort special channels for the percolating waters may be determined, and "calcareous concretions" produced of all sorts of irregular forms. Moreover, it would be the most natural thing in the world that some of the concretions whose form is determined by other conditions should considerably resemble some of the least regular and perfect of those formed in the way I have explained. Admitting that all the "concretions," regular and irregular, are the result of the unequal hardening of the stone by the cementing action of water, the regular saucer-shaped cavities already described are so frequent and so acteristic that it is worth while to inquire what is the special con-t which has hardened the rock in precisely that form. That question, I believe, is satisfactorily answered in the explanation I have given. Sir Wyville Thomson's explanation I transcribe entire, lest I should do injustice in criticizing a passage which I do not quite understand. "In the caves in the limestone, owing to a thread of water having found its way in a particular direction through the porous stone of the roof, a drop falls age after age on one spot on the cave-floor accurately directed by the stalactite which it is all the time creating. The water contains a certain proportion of carbonate of lime, which is deposited as stalagmite as the water evaporates, and thus a ring-like crust is produced at a little distance from the spot where the drop falls. When a ring is once formed, it limits the spread of the drop, and determines the position of the wall bounding the little pool made by the drop. The floor of the cave gradually rises by the accumulation of sand and travertine, and with it rise the walls and floor of the cup by the deposit of successive layers of stalagmite; and the stalagmite produced by the drop percolating into the limestone of the floor hardens it still further, but in this peculiar symmetrical way."* On this explanation I will only remark that stalagmites deeply and broadly concave on the top, and cave-floors rising by accumulation of sand and travertine (the material having the structure of drift sand-rock) so as to keep nearly on a level with the growing bosses of stalagmite, are phenomena never observed, to my knowledge, in Bermuda or elsewhere.

---

[*] Geological Observations on the Volcanic Islands and parts of South America visited during the Voyage of H. M. S. Beagle. Second edition. London, 1876. pp. 161–165. Journal of Researches into the Natural History and Geology of the Countries visited during the Voyage of H. M. S. Beagle round the World. New edition. New York, 1875. p. 450.

[†] Geological Observations, p. 163.

[‡] Geological Features of the Bermudas, p. 24.

[§] Op. cit., pp. 115, 116.

[‖] Geological Features of the Bermudas, p. 21.

[¶] Op. cit., Vol. I., pp. 306–311.

---

* Thomson, op. cit., Vol. I., p. 308.

NON-CALCAREOUS ROCKS AND MINERALS.

While the only indigenous rocks in Bermuda are the various varieties of limestone, the "red earth," and the peat or muck of the bogs, grains and nodules of various minerals, mostly volcanic in origin, occur mingled with the coral sands, and blocks of various rocks are liable to be occasionally brought in the roots of drifted trees. These accidental arrivals are common to all oceanic islands.

John Murray, F. R. S. E., in a letter to General Sir J. H. Lefroy (a copy of which has been furnished me by the kindness of J. Matthew Jones, F. L. S.), names the following minerals as occurring in samples of Bermuda sands examined by himself: menaccanite, magnetite, augite, olivine, hornblende, sanidin and other feldspars, mica, and perhaps quartz. Mr. Murray notes the fact that the "red earth," on treatment with acids, leaves a residue much resembling the "titaniferous sands" found at various localities along the shore. He suggests that the volcanic minerals of the "titaniferous sands" may have been in great measure washed out by rains from the "red earth." The following interesting passage is quoted from the letter above mentioned: "I think it most probable that in the far past there would be a great quantity of this sand on the shores of the then Bermuda. This, however, as the island sank, and the coral grew, would become less and less in proportion to the coral sand. Some of it would, one may be sure, always be carried up by the wind along with the coral sand, and these grains would accumulate in the 'red earth,' which one must regard as the residue after the removal of the calcareous matter. In this way, much of this volcanic sand may have belonged to the original Bermuda. Much of it, I cannot but think, has been carried to the island by pumice stone. Volcanic and other dust carried by the winds will doubtless have contributed to the mineral particles we now find in the rock of Bermuda." The considerable abundance of menaccanite, magnetite, augite, olivine, and other volcanic minerals in the sands at various localities may be due to the fact that the material has been repeatedly worked over—now blown up in sand-dunes, now washed down to the shores by the rains. Thus the comparatively insoluble grains would be concentrated and reconcentrated by the removal of the more soluble calcium carbonate. Whether these volcanic grains are in part indigenous, as Mr. Murray supposes, or have all been transported to the island in the form of pumice or otherwise, we might reasonably expect that they would now occur here and there in considerable abundance as the result of this process of concentration.

---

* *Op. cit.*, Vol. I., pp. 308, 309.

Nelson reports the occurrence of "small pieces of oxide of iron, of very questionable origin; menaccanite, found near the ferry between St. George's Island and Bermuda or Main Island; arragonite; and a minute quantity of manganese in the red earth." * Among the nodules of oxide of iron I have recognized both hematite and limonite. J. Matthew Jones has noticed the occasional occurrence of pieces of trap, doubtless brought among the roots of drifted trees.† George W. Hawes, Ph. D., late of the United States National Museum, has noticed the occurrence of pebbles of a variety of kinds of rocks. In a letter to me, a few weeks before his death, he wrote concerning them as follows: "One is a beautiful augite porphyry with large crystals finely formed of augite, and most of them are eruptive rocks; but I have two that are plainly silicious, apparently metamorphic rocks. I have found two quartz (flint) pebbles, small in size, and one I took out of the inside of a sponge."

---

* Op. cit., p. 106.

† Geological Features of the Bermudas, p. 22.

FOSSILS.

Fossils of recognizable character are found chiefly in the comparatively scanty deposits of beach-rock. The drift-rock, however, contains in abundance shells of several species of land snails, the most common being *Zonites bermudensis* and the perhaps specifically distinct variety *nelsonii*, *Helix microdonta*, and *Helix circumfirmata*. Among these it is noteworthy that *Zonites bermudensis* var. *nelsonii* no longer exists in a living state. The other three forms are still abundant residents of the islands. Shells of *Livona pica* are also abundant in the drift-rock, having doubtless been carried up from the water by "soldier" or hermit crabs. I have also observed bones of birds and fragments of the shells of crabs. The remains of marine shells and corals in the drift-rock are usually so finely comminuted as to be unrecognizable.

The beach-rock in several localities contains marine shells in great abundance and variety. Nelson appears to be not far out of the way in the statement that "almost every shell now known in the surrounding sea may be found in the rock."[*] I made no endeavor to make a complete collection of the fossils of the beach-rock. I append, however, a list of the shells which have been recognized among the specimens of rock which I collected to illustrate the geology of the islands. The list may be of some interest as indicating in general the most common species of fossils:

Mytilus exustus, Linn.,
Pectunculus ———,
Barbatia domingensis, Lam.,
Lucina pennsylvanica, Linn.,
Chama macerophylla, Chem.,
Chama lingua-felis, Reeve,
Bulla media, Linn.,
Fissurella barbadensis, Gmel.,
Fissurella graeca, Lam.,
Livona pica, Linn.,
Nerita peloronta, Linn.,
Truncatella ———,
Vermetus lumbricalis, Linn.,
Tectarius muricatus, Linn.,
Cerithium versicolor, C. B. Ad.,
Cyphoma gibbosa, Linn.,

---

[*] *Op. cit.*, p. 114.

Cypraea ——,
Trivia rotunda, Kien.,
Columbella mercatoria, Linn.,
Columbella cribraria, Lam.,
Olivella oryza, Lam.,
Nasa candei, d'Orb., var. *antillarum.*

For the preparation of the above list I am indebted to Henry L. Osborn, A. B., formerly assistant in Natural History in Wesleyan University. Besides the shells of mollusks, those of Balanus also occur. Fragments of coral admitting of specific identification appear to be rare, the fragile skeletons of the coral animals having generally been pretty thoroughly comminuted.

PART II.

THE BOTANY OF BERMUDA.

BY

General Sir JOHN HENRY LEFROY, F. R. S.

(GOVERNOR OF BERMUDA, 1872-1877.)

ATHENÆUM CLUB, LONDON.

THE BOTANY OF BERMUDA.

From the limited area of the Bermudas, which does not exceed 20 square miles; from their evenness of surface, which nowhere rises more than 250 feet above the sea; and from the uniformity of the soil, which is almost entirely derived from the disintegration of calcareous or coralline sand, the botanist would naturally expect a native vegetation of very little range or variety, and if he remembers their position on the eastern margin of the Florida Gulf Stream he will further expect a predominance of West Indian species among those that may exist. Both these inferences would be correct, but there are some other factors which have materially modified the result. This green oasis in the desert of Atlantic waters, so late discovered by man,* was for countless ages before that epoch, as it still is a resting place for birds in their migrations from the American continent. Man himself when he came found a soil of virgin fertility and a singularly genial climate, giving welcome alike to strangers from the north and from the south. Thus for nearly three centuries seeds and plants from the most distant parts of the world have been introduced by him, or have followed in his foot-steps and made themselves at home, until it is in many cases difficult to decide whether design or natural causes independent of human agency or mere accident have produced the assemblage we find.

For about eighty years Indian corn (*Zea mays*) and tobacco, both of them exhausting crops, were the staple products of Bermuda, varied chiefly by sweet potatoes (*Ipomœa Batatas*), and it is not improbable that the opinion which prevailed in the last century of a deterioration of the soil may have had some foundation, although the cause assigned, "the cutting down of pine and spreading cedar trees," can have had little to do with it. The cedar tree itself is the enemy of cultivation, and nothing valuable grows under its shade. Its roots run to astonishing distances, and, as every one knows who has tried to improve plantations in the neighborhood of cedar trees, they monopolize all the good soil they can reach.

---

* About 1511.

"It is universally agreed," says Dr. Robertson, "that the nature of this (St. George's) and the other Bermuda Islands has undergone a surprising change for the worse since they were first discovered, the air being much more inclement, and the soil much more barren than formerly; this is ascribed to the cutting down of those fine spreading cedar trees for which the islands were famous, and which sheltered them from the blasts of the north wind at the same time that it protected the undergrowth of the delicate plants and herbs. In short, the Summer Islands are now far from being desirable spots; and their natural productions are but just sufficient for the support of the inhabitants, who, chiefly for that reason, perhaps, are temperate and lively to a proverb. * * * The Bermuda Islands, however, might still produce some valuable commodities were they properly cultivated; * * * their oranges are still valuable; their soil is also said to be excellent for the cultivation of vines."*

As the historian had never visited the islands, his opinion is only cited for the strong testimony he bears to the general opinion a century ago that they were barren. There is, in fact, but very little good soil among them; the element *silica* in particular, which enters so largely into the composition of most fertile soils, being very wanting; *potash* and *soda* present in very small quantities, and *iron*, in the form of oxide or peroxide, much in excess in the soils which are otherwise the best. The small number of deciduous trees, and the prevalence of the cedar (*Juniperus Bermudiana*), which contributes little to the soil, are also a source of poverty.

---

* Robertson's America, 1777, VI., p. 286.

The following table, extracted from an agricultural report drawn up by the writer in 1873, and based on analyses by Mr. F. A. Manning and others, gives a concise view of the mineral elements of the Bermuda soils:

TABLE I.—*Relative proportions of the component parts of Bermuda soils, omitting water.*

	White soil.		Red soils.							
	Manning.		Professor Bernays.	Professor Abel.	Mr. Manning.					
					No. 3.		No. 4.		No. 5.	
	No. 1, sand.	No. 2, mud.			Soluble.	Insoluble.	Soluble.	Insoluble.	Soluble.	Insoluble.
Water (not included)	0. 316	18. 134	18. 7	42. 57	16. 231		6. 930		23. 20	
Organic substance	3. 816	4. 700			13. 280		16. 260		16. 710	
Lime	52. 47	51. 400		5. 59	3. 724	0. 431	1. 250	2. 386	10. 077	
Lime, carbonate of			4. 31							
Lime, sulphate of			2. 50							
Magnesia	1. 686	0. 756		3. 50	0. 018	0. 550	0. 099		0. 199	0. 217
Magnesia, carbonate of			3. 32							
Alumina				20. 44	0. 173	16. 155	0. 120	24. 850	0. 105	9. 474
Sand and insoluble clay	0. 050	0. 047		48. 70		47. 380		21. 910		40. 670
Silica			45. 74							
Oxide of iron and alumina	0. 520		43. 67							
Oxide of iron		0. 213								
Oxide of protoxide				trace						
Oxide of sesqui or peroxide				13. 29	0. 047	14. 580	0. 362	30. 880	0. 046	12. 840
Potash	0. 064	0. 088				0. 140		0. 169		0. 113
Soda	0. 243	0. 070				0. 007		0. 060		0. 033
Carbonic acid	42. 866	42. 580		5. 55	2. 666		0. 836		8. 676	
Sulphuric acid	0. 206				trace		0. 065		0. 040	
Silicic acid					0. 149		0. 037		0. 159	
Phosphoric acid	0. 007	0. 124		2. 93		0. 742		0. 676		0. 681
Chlorine	0. 020	0. 011					0. 046			
Chlorides, phosphates, &c., not determined			1. 06							
					20. 058	79. 945	19. 075	80. 931	36. 012	64. 030
	102. 01	99. 99	100. 0	100. 00	100. 0		100. 0		100. 0	

Notwithstanding, however, this want of natural fertility due to the geological origin of the group, and to a cause, perhaps, remotely connected with the stormy character of the region, the abundance of rain and the genial temperature make up for many disadvatages. There appear to be few West India plants or fruits which could not be grown in the islands with a proper selection of localities. It is otherwise, however, as Dr. Rein has remarked* with many fruits belonging to northern temperate regions; many American species which on the continent descend to much lower latitude refuse to flourish or die out in Bermuda, not so much, probably, from the heat of the summer as from the sustained high temperature of the winter, which is such that the temperature of the soil six inches below the surface was never found lower than 52°.66.

---

*Strawberries, grapes, figs, peaches, ripening in March and April, grow in Bermuda, but not the ordinary kernel and stone fruits.—Rein.

Frost is nearly, but not quite, unknown. There are but two well authenticated cases on record. On the 24th December, 1840, while frost was visible "in low situations, water in tubs was frozen to the thickness of half a crown."* On the 21st February, 1878, a thermometer on grass registered 28°.2. There is a tradition of snow, about 1811 or 1812;† a few flakes, indeed, fell at St. George's on the 4th March, 1874. On 20th February, 1872, the ground was in some places white with hail, which did not disappear for some hours. These facts are sufficient to show that the temperature of the air is subject to much greater extremes than are experienced at sea level within the tropics, although the vegetation partakes so largely of a tropical character.

Low temperatures occur most frequently in the month of March. During the years 1872–'77 a thermometer on grass registered below 40° F., as follows:

In December 2 times, lowest 35°.2 in 1876.
In January 4 times, lowest 34°.0 in 1874.
In February 3 times, lowest 35°.0 in 1877.
In March 8 times, lowest 35°.0 in 1877.

Notwithstanding many years of observation, the data for determining the mean temperature of the air are imperfect. Observations have only been made at 9 or 9½ a. m., and at 3 or 3½ p. m., and the diurnal low for the several months is unknown. While the record was kept by the royal engineers, however, a monthly term day of hourly observation was observed, and from the days so recorded some approximation to the horary corrections might probably be derived, but I prefer to give the actual observations at those hours, subject to future reduction. To these are added in the subjoined table the mean temperature of the soil at 6 inches and 12 inches depth, which will have future value, the International Meteorological Congress held at Rome in April, 1879, having resolved to include for the future the temperature of the surface of the earth among the meteorological elements to be observed.

---

* Mr. J. L. Hurdis, in Jones' "Naturalist in Bermuda."

† Mr. John Harvey Darrell is the authority for this statement.

TABLE II.—*Conditions of temperature and rainfall affecting vegetation in Bermuda.**

	Temperature of the air.		Temperature of the soil.		Mean rainfall.
	9 a. m.	3 p. m.	6 inches.	12 inches.	
	°	°	°	°	*In.*
January	64. 0	65. 5	62. 0	62. 5	3. 8
February	63. 7	65. 1	61. 1	61. 4	4. 2
March	63. 8	65. 5	61. 5	61. 5	3. 6
April	67. 4	69. 3	64. 8	64. 9	3. 3
May	72. 0	73. 5	69. 9	69. 5	4. 1
June	76. 8	78. 8	74. 5	73. 9	3. 3
July	81. 3	82. 9	78. 3	77. 9	4. 0
August	82. 5	84. 2	79. 1	79. 2	3. 9
September	80. 2	81. 9	77. 1	76. 9	4. 8
October	75. 5	76. 7	73. 4	73. 7	6. 7
November	69. 8	71. 1	67. 2	68. 1	5. 7
December	65. 4	66. 4	62. 9	63. 2	4. 0
	71. 9	73. 4	69. 3	69. 4	51. 4

*The mean temperatures are given by observations extending (with some *lacunæ*) from August, 1855, to March, 1877. The temperature of the soil at 6 inches is the mean between observations at 9 a. m. and 5 p. m., apparently the hours of extreme daily range. The temperature at 12 inches is that at 9 a. m.; the daily range at this depth is under 0°.5, and is about the mean at 9 a. m.

The earth temperatures are probably very near the true mean temperatures of the air. The rainfall is not the same all over the island. It is decidedly greater in the broader and more wooded region towards the center than at either extremity, and is least about the light-house, where the island is narrow and comparatively denuded of wood. There are grounds for supposing, also, that the mean temperature at the east end, probably under the influence of the cold northeast winds of winter, is lower than in the central regions; but these are niceties not affecting the present question.

Under the conditions of climate thus briefly described the cocoanut and sugar-cane grow, but not to perfection. The writer had no success with pine-apples, although they were formerly grown in Bermuda. The orange, lemon, lime, fig, mango, banana, pawpaw, avocado pear, pomegranate, loquat, litchi, and the anona family come to perfection. Strawberries and excellent celery, with all ordinary vegetables of the table, thrive in the winter. Apples, pears, plums, cherries, almonds, apricots, nectarines are a complete failure. The raspberry and blackberry die out, and neither rhubarb nor asparagus can be grown to any satisfaction. The peach, although not now actually produced, all the trees in the island being infested by the peach fly, was very abundant twenty years ago, and therefore differs from other stone fruits, in being suitable to the climate.

The reader of the following list will notice frequent references to "the

Walsingham tract." This remarkable region is a narrow ridge, about two miles long and from a quarter to half a mile wide, which separates Castle Harbor from Harrington Sound, at the east end of the islands, and does not altogether comprise above 200 acres, including Tucker's Town. It contains nearly the whole of the indigenous vegetation of the group. A few characteristic species, such as *Randia aculeata*, *Pavonia spinifex*, *Myginda Rhacoma*, are only found at the other end, and a few are diffused here and there pretty generally. Such are *Eugenia axillaris*, *Forestiera porulosa*, and *Dodonæa viscosa*. But, on the whole, this small tract is the Mecca of the botanist in Bermuda, and his pilgrimages will be many before he exhausts it. For this we must, of course, seek a geological cause. This narrow ridge of land, honey-combed by caverns, fretted with the dissolving rains of ages, and rent by fissures, is, in the writer's opinion, the last surviving contemporary of former Bermudas that have disappeared, whose surface-rocks form the reefs that fill Castle Harbor and both the sounds, and form the northern barriers against the fury of the Atlantic. The evidence in support of this opinion would be out of place in this section. It will be evident that if such be the case, we should expect to find here, as we do find it, the greatest accumulation of those species which, not being capable of self origination anywhere, can only have reached this very isolated spot by the slow operation of natural causes long continued. The surface of the contemporary Bermuda is not of high geological antiquity, as follows necessarily from its Æolian origin and its continuous subsidence, but what it has of antiquity is to all appearance found here.

The following is a list of 25 species exclusively or almost exclusively to be looked for in the Walsingham tract. They are nearly all West Indian, few of them American in the sense of belonging to regions of corresponding latitude on the continent.

Achyranthes sp.	W. I.
Ampelopsis quinquefolia	A.
Asplenium crenulatum	
Asplenium myriophyllum	
Callicarpa ferruginea	W. I.
Chiococca racemosa	W. I.
Dodonæa viscosa	W. I.
Elæodendron xylocarpum	W. I.
Eugenia axillaris	W. I.
Forestiera porulosa	W. I.
Guilandina Bonducella	W. I.
Ipomœa purpurea	W. I.
Jasminum gracile	W. I.
Jatropha Curcas	W. I.
Passiflora ciliata	W. I.
Peperomia obtusifolia	W. I.
Psilotum triquetrum	W. I.
Psychotria undata	W. I.
Pteris heterophylla	W. I.
Sabal Adansonii	A.
Sicyos angulatus	A.
Sponia Lamarckiana	W. I.
Statice Limonium, var. Caroliniana.	A.
Triumfetta semitriloba	W. I.
Xanthoxylum Clava-Herculis	W. I.

The species in the general list which the writer considers to be native—that is to say, introduced by natural causes irrespective of human agency, and probably earlier than the settlement of the islands in 1612—are 150 in number, distinguished by the letter A in the alphabetical index. For the convenience of the botanical reader they are here enumerated.

List A.—Species regarded as native.

Acrostichum aureum	W. I., A.
Adiantum cuneatum	S. A.
Æschynomene, sp	W. I., A.
Ampelopsis quinquefolia	A.
Arundinaria tecta	A.
Asclepias Curassavica	W. I.
Ascyrum Crux Andreæ	A.
Aspidium capense	S. A.
Aspidium Thelypteris	A.
Asplenium crenulatum	W. I.
Asplenium dentatum	W. I., A.
Asplenium myriophyllum	W. I., A.
Asplenium Trichomanes	A.
Atriplex cristata	S. U. S.
Avicennia nitida	W. I.
Baccharis heterophylla*	
Boehmeria cylindrica	W. I., A.
Borrichia arborescens	W. I., S. U. S.
Cakile maritima	W. I.
Cakile maritima, var. ? æqualis.	W. I.
Callicarpa ferruginea	W. I.
Canavalia obtusifolia	W. I.
Cardiospermum Halicacabum	W. I., A.
Cardiospermum Halicacabum, var microcarpum	W. I.
Celtis Missisipiensis	A.
Cenchrus echinatus	W. I., A.
Cenchrus tribuloides	W. I., A.
Centrosema Virginianum	W. I., A.
Ceratophyllum demersum	W. I., A.
Chara fœtida	W. I., A.
Chiococca racemosa	W. I., A.
Coccoloba uvifera	W. I., A.
Conocarpus erectus	W. I., A.
Convolvulus Jamaicensis	W. I.
Dichondra Carolinensis	A.
Dichondra repens	W. I., A.
Desmodium virgatum	W. I.
Dodonæa viscosa	W. I., A.
Eclipta erecta	W. I., A.
Elæodendron xylocarpum	W. I.
Elæodendron melanocarpum	A.
Eleocharis plantaginea	W. I., A.
Equisetum palustre	A.
Eugenia axillaris	W. I.
Forestiera poralosa	W. I.
Guilandina Bonducella	W. I.
Heliotropium Curassavicum	W. I., A.
Herpestis Monniera	W. I., A.
Hydrocotyle Asiatica	W. I.
Hydrocotyle repanda	A.
Hydrocotyle umbellata	W. I.
Ipomœa Jamaicensis	W. I.
Ipomœa Nil	W. I.
Ipomœa Pes-capræ	W. I., A.
Ipomœa purpurea	W. I.
Ipomœa sagittata	A.
Juncus maritimus	A.
Juncus tenuis	W. I., A.
Jungermannia sp	
Juniperus Bermudiana	W. I.
Kosteletzkya Virginica	A.
Laguncularia racemosa	W. I., A.
Lemna minor	W. I., A.
Lemna trisulca	W. I., N. U. S.
Lippia micromera	W. I.
Lippia nodiflora	W. I., A.
Lippia lanceolata	W. I.
Lithospermum distichum	W. I.
Montia fontana	E.
Morinda roioc	W. I., A.
Myginda Rhacoma	W. I., A.
Myrica cerifera	A.
Nama Jamaicensis	W. I., A.
Nepeta Cataria	A.
Nephrodium amplum	W. I., S. A.
Nephrodium patens	A.
Nephrodium tetragonum	S. A.
Nephrodium villosum	W. I., S. A.
Nephrolepis exaltata	W. I., A.
Œnothera biennis	A.
Œnothera humifusa	A.
Œnothera rosea	W. I.
Œnothera sinuata	A.

---

* There are five West Indian and three American species, but none of them the same as the Bermuda species.

Opuntia Tuna	W. I.
Opuntia vulgaris	A.
Osmunda cinnamomea	A.
Osmunda regalis	A.
Panicum brevifolium	W. I.
Panicum capillare	A.
Panicum lineare	A.
Panicum molle	W. I.
Panicum virgatum	A.
Paspalum distichum	W. I., A.
Paspalum filiforme	W. I.
Paspalum setaceum	W. I.
Pavonia spinifex	W. I.
Phryma leptostachya	A.
Pluchea odorata	W. I.
Pluchea purpurascens	W. I., A.
Polypodium plumula	W. I.
Polypogon Monspeliensis	A.
Portulaca oleracea	W. I., A.
Psilotum triquetrum	W. I., A.
Pteris aquilina	W. I., A.
Pteris heterophylla	W. I.
Rhachicallis rupestris	W. I.
Rhizophora mangle	W. I., A.
Rhus Toxicodendron	A.
Rhynchospora florida	W. I.
Rhynchospora fusca	
Rhynchospora pura syn	
Rhynchospora speciosa	
Rhynchospora stellata	W. I.
Ricinus communis	W. I., A.
Ruppia maritima	W. I., A.
Sabal Palmetto	A.
Salicornia fruticosa	A.
Scœvola Plumieri	W. I., A.
Scirpus plantagineus	W. I.
Scirpus validus	W. I.
Senebiera pinnatifida	W. I., A.
Sesuvium Portulacastrum	W. I., A.
Sicyos angulatus	A.
Sida carpinifolia	W. I.
Sisyrinchium Bermudiana	
Solanum nigrum	W. I., A.
Solanum nigrum, var. nodiflorum.	W. I.
Solanum torvum	W. I.
Sophora tomentosa	W. I., A.
Sphagnum palustre	
Spermacoce tenuior	W. I., A.
Spiranthes brevilabris	W. I.
Sponia Lamarckiana	W. I.
Sponia elongatus	W. I.
Sporobolus Indicus	W. I., A.
Sporobolus pungens	S. A.
Sporobolus Virginicus	W. I., A.
Stachytarpheta Jamaicensis	W. I., A.
Statice Limonium, var. Caroliniana	A.
Stenotaphrum Americanum	W. I., A.
Suriana maritima	W. I.
Tournefortia gnaphalodes	W. I., A.
Triumfetta Lappula	W. I.
Triumfetta semitriloba	W. I.
Typha angustifolia	W. I., A.
Waltheria Americana	W. I., A.
Woodwardia Virginica	A.
Xanthoxylum aromaticum	W. I.
Yucca aloifolia	W. I.
Zostera marina	

The distinction between this class and the next is arbitrary, and the classification has been governed by an estimate of probabilities in each case. Nature had a long reign in Bermuda. Man and the animals introduced by man have had a comparatively short period for modifying its flora. It seems safer to suppose that plants like *Guilandina Bonducella* or *Sicyos angulatus*, met with but once in a wild place and a wild state, are truly native, than to infer from their rarity that they have been introduced or have recently followed the footsteps of man.

The species then regarded as exotic, although completely naturalized, and for the most part generally diffused, that is to say, in the words of Sir Joseph Hooker, "species which have followed in the track of man or animals introduced by him, and have thus become quasi-indigenous, or naturalized,"[*] are 166 in number, distinguished by the letter B. The importation of seeds for *agricultural* and *horticultural* purposes for two centuries and a half accounts for a great number of chance species, especially the importation of hay from America.

---

[*] Sir Joseph Hooker. Lecture on Insular Floras, delivered before the British Association for the Advancement of Science, at Nottingham, 1866.

The species which may also be said to be naturalized, but were originally introduced, designedly for cultivation or ornament, whose presence is, therefore, due to direct human agency, more or less traceable, and which cannot in any sense be regarded as native, 414 in number, are distinguished by the letter C.

Lastly, there remains a large and fluctuating class of plants, of horticultural but not botanical interest, which are found here and there under cultivation, but have no proper place in the local flora. They are inserted in the catalogue to complete the view of the vegetation of Bermuda, as related to climate, and as it presents itself to the visitor. These names, 215 in number, are printed in *Italics*. Many of them date no further back than the writer's term of residence at Government House, where one of his first acts was to import a professed gardener, Mr. Michael Middleton, and a skilled laborer, George Payne, from Kew. They arrived in November, 1871, and from that time to the end of 1876, few months passed without the introduction and trial of new plants. Under a friendly rivalry, many more were at the same time brought up from the West Indies to Clarence House, by successive naval commanders-in-chief, especially by Admiral Sir Cooper Key, who followed the governor's example in erecting a conservatory. The present governor, Sir Robert Laffan, has long been known for a taste for horticulture. The garden proper at Mount Langton is, unfortunately, of very limited extent, and of a light, poor soil, possessing only the advantage of abundant water. The grounds are extensive, but made up of hills and slopes, thinly clothed with soil, much exposed to northerly winds, and offering very few spots favorable for planting. It adds not a little to practical difficulties that cartage is rendered tedious and laborious by the distribution of the premises. All this notwithstanding, much was done in the years 1871–'76 to extend the flora of the island, and a considerable amount of horticultural experience gained, which should not be thrown away. The social circumstances of Bermuda are peculiar. The resident gentry are too few in number to keep up a corps of professional gardeners; the colored native laborers are rarely intelligent enough for the trade, do not appear to have much natural taste for flowers, although somewhat given to depredations in gardens, and have had very little opportunity of learning. It

Brunfelsia Americana, *Phacelia congesta*, *Dolichos Lablab* were all added to the list, as the result of accidental observation in old gardens at St. George's.

Any scientific value the following list may possess, beyond its record of facts of observation, such as localities, times of flowering, &c., is due to the obliging supervision of Sir Joseph Hooker, under whose eye the classes have been rearranged, the references checked, and the nomenclature corrected. The writer is responsible for the distribution of the species as native, naturalized, or introduced, distinguished by the letters A, B, and C, in the index. The Linnæan orders and the etymology of names are given where they appear likely to be of assistance towards the identification of plants. Synonyms are only given where the names appear in Grisebach's flora, or in some accredited list of Bermuda plants.

J. H. LEFROY.

DECEMBER 31, 1879.

BOTANY OF THE BERMUDAS.

I.—RANUNCULACEÆ.

Clematis Flammula, Linn. Sweet Clematis.

Introduced originally from Southern Europe. It grows luxuriantly over a verandah in Reid Street, Hamilton, flowering in autumn.

Clematis Japonica, Thursb., *var Jackmanni.*

Introduced in 1874 and flowered annually about July, but not freely.

Ranunculus muricatus, Linn. Buttercup.

Naturalized from Europe, and general.

Ranunculus parviflorus, Linn.

Common about Hamilton.

Delphinium consolida. Larkspur.

Garden varieties are common.

II.—MAGNOLIACEÆ.

Magnolia grandiflora, Linn. Magnolia.

A tree of large size at Peniston's, introduced from the Southern United States. It flowers in June. *M. glauca* Linn. and *M. purpurea* Curt. were introduced at Mount Langton in 1875, and flowered feebly, but died out. The climate or soil appeared not to suit them.

Liriodendron Tulipifera, Linn. Tulip tree or White Poplar of the Southern United States.

A healthy tree at Par-la-ville; flowers in June.

III.—ANONACEÆ.

Anona muricata, Linn., (*A. tripetala*, Ait.). Sour sop.

Introduced from the West Indies; met with in many old gardens.

A. squamosa, Linn. Sweet sop; Sugar apple.

Met with at Camden's, near Hamilton, but not common in the island. Native of South America.

A. Cherimolia, Mill. Cherimoya.

A rare fruit in Bermuda, first raised from seed in 1853. Native of South America.

A. reticulata Linn. Custard apple, Sugar apple.

Met with in many old gardens. A native of South America.

None of the Anonas are in any abundance, not, however, for want of suitable soil or a suitable climate. They are easily grown. The neglect of the cultivation of fruit is traceable to social causes, and to the want of a sufficiently large market.

IV.—NYMPHEACEÆ.

Nymphæa cærulea, Savign. and *N. dentata*, Sch. and Thonn.

Roots were procured from England in 1874 and survived two or three years, but made no growth and never flowered. They were tried in ditches with feebly running water and in tanks.

V.—SARRACENIACEÆ.

Sarracenia purpurea, Linn. Pitcher plant.

Was introduced at Mount Langton and flowered, but died off. The climate apparently too hot, although it is found from Florida northward.

VI.—PAPAVERACEÆ.

Argemone Mexicana, Linn. Queen thistle; Prickly poppy.

Very common—a yellow dye is sometimes made from the flowers. From the wide diffusion of this plant it may be native; name from argema, a disease of the eye for which the juice is supposed to be medicinal.

Capsella Bursa-pastoris Moh. Shepherd's purse.

A weed in gardens. Probably introduced from Great Britain, but of very general diffusion.

Iberis violacea Ait. Candytuft.

Quite naturalized by road-sides, chiefly in St. Georges Island, to which its delicate and abundant flowers are a pleasing ornament.

Cakile maritima, Scop., var. *æqualis* Sea-rocket? L. Her., Scurvy grass.

Very common along the shores, and occasionally cooked for food.

Raphanus sativus, Linn. Radish, cultivated.

Malcolmia maritima, R. Br.

Probably introduced from Europe.

Ciambe cordata Willd.?

From Cambridge, Mass., 1874.

Matthiola incana, R. Br. Wild stock.

To be found, but not abundantly, among the rocks along the southern shore, in Warwick Parish. Probably escaped from gardens.

Cheiranthus cheiri, Linn. Wall Flower.

Met with in gardens.

IX.—CAPPARIDACEÆ.

Cleome speciosa, H. B., Candelabra plant.

Native of Mexico, common in West Indies. Introduced and almost a weed, seeding itself abundantly at Mount Langton. Two varieties, purple and white. It grows to a height of 3 feet or more.

C. pungens, Willd. The white variety.

Capparis torulosa, Sw. var. of *C. Jamaicensis*, Jacq., Black willow.

To be found at Par-la-ville, where it may be recognized by its glossy leaves, rusty beneath, branches and inflorescence covered with scales; a shrubby tree about 10 feet high; name from the Arabic *Kabar*. The caper plant, *C. spinosa*, Linn., so abundant at Malta, would probably also thrive in similar situations in Bermuda, but is not known.

Steriphoma elliptica, Spreng.

Received from Trinidad 1874, and flowered.

X.—MORINGEÆ.

Moringa pterygosperma, Gærtn. Horseradish tree.

Easily known by its large and graceful *decomposite-pinnatisect* leaves, and small white flowers. Originally of the Old World, but introduced from Turks Islands; may be seen at Somerville and elsewhere. This tree produces the famous Ben oil, extensively used by watch-makers.

XI.—RESEDACEÆ.

Reseda odorata, Linn.? Mignonette.

Cultivated in gardens.

XII.—CISTACEÆ. Rock rose family.

Cistus laurifolius, Linn.

C. salvifolius, Linn.

C. Monspeliensis, Linn.

Were introduced from Cambridge, Mass., in 1874, and were living in 1877, but did not appear to flourish.

XIII.—VIOLACEÆ.

Viola odorata Linn. Sweet violet.

A large variety is established at Mount Langton, and flowers sparingly; but the violet can scarcely be said to be known in Bermuda.

V. tricolor Linn. Pansy; Heart's-ease.

Grown in gardens.

XIV.—BIXINEÆ.

Bixa Orellana Linn.

Grew readily at Mount Langton, but is not generally met with. Introduced from West Indies.

Flacourtia Ramontchi Herit., W. Governor's Plum.

To be found in a few gardens only. A native of Madagascar and the East Indies.

F. prunifolia H. B.

Introduced at Mount Langton from Botanical Garden, Trinidad, 1872, but it did not appear to thrive, and had not flowered in 1877.

XV.—PITTOSPOREÆ.

Pittosporum coriaceum Ait.

A tree of considerable size at Bishop's lodge; no other specimen known. Probably introduced from Madeira.

P. undulatum, Vent., Laurel.

Native of New South Wales, and probably, therefore, of recent introduction. Its cymes of fragrant, graceful white flowers may be seen at the Rectory, Pagets Parish, and elsewhere in March–April; readily propagated by cuttings.

XVI.—CARYOPHYLLACEÆ.

Arenaria serpyllifolia, Linn. Thyme leaved sandwort.

A small annual weed; common in waste places; probably from Europe.

Stellaria media, Sm. Stickwort. Chickweed.

Common chickweed in gardens.

S. nemorum, Linn.

This species will be found in tangled creeping masses along the crags southwest of the Church cave. From the star-shaped flower.

Cerastium viscosum, Linn. Mouse ear; chickweed.

A weed from Europe.

PORTULACACEÆ.

Portulaca oleracea, Linn. Small-leaved Purslane, Turtle grass.

A very common yellow flowering weed in gardens; sometimes used as a pot herb. Probably native, being generally diffused in the West Indies and Southern States.

Sesuvium Portulacastrum H. B. Sea Purslane.

Found along the sea shore in moist places, and in Hamilton Parish marsh; may be distinguished by the absence of petals, the numerous stamens of deep rose color, and the delicate pink lining to the sepals, which are externally a bright green; otherwise much like Purslane in habit. Flowers in September.

Montia fontana, Linn. Water Chickweed.

Common in ponds and ditches.

XVII.—HYPERICACEÆ.

Ascyrum Crux-Andreæ, Linn. St. Andrews' cross, St. John's wort (*A. hypericoides*, Linn Sw.)

This pretty plant is abundant in Pembroke marsh, and not uncommon on hillsides in moist places, easily known by its delicate foliage, cross-shaped yellow flowers, and perforated leaves.

XVIII.—GUTTIFERÆ.

Mammea Americana, Linn. Mammea.

The Mammee fruit is ripe in September, but the trees are confined to a few old gardens—*e. g.*, at Cavendish, Devonshire Parish; originally from the West Indies. (*Lucuma Mammosa* in Reid's list.)

Calophyllum Calaba Jacq., Galba.

From the West Indies; a slow growing, useless tree, somewhat ornamental for its glossy leaves, and therefore planted in fences; flowers in August–September.

XIX.—TERNSTRŒMIACEÆ.

Camellia Japonica, Linn.

The camellia is scarcely known in Bermuda. Plants imported from Halifax nurseries have, however, flowered. The heat appears too great.

XX.—MALVACEÆ.

Sida carpinifolia, Linn. Wire weed.

Probably native or from the Canaries; very early mentioned in Laws, 1669; still a very abundant and troublesome weed.

Pavonia spinifex, Cav., Burr bush.

Found only in Southampton Parish, and not very common. Easily known by its curiously spiked fruit, or seed vessel; shrub 4 or 5 feet high, probably naturalized from the West Indies at no remote period, after Don José Padon.

Kosteletzkya Virginica, Pres. Mallow.

The very pretty rose-colored flowers of this plant appear in October, but are confined to the upper end of Pembroke marshes.

Abutilon striatum, Dicks. Mallow.

Common in gardens; introduced from Baltimore about 1852.

A. pulchellum. Sweet or White Abutilon.

In gardens, not common.

Hibiscus tiliaceus, Linn. Mahoe.

Known to have been raised about fifty years ago from seed washed on shore; one large handsome tree at Somerville, in Smith's Parish; smaller ones elsewhere; quite naturalized.

H. Rosa-Sinensis, Linn.

Common in gardens.

H. grandiflorus, Michx.

Introduced from Trinidad 1874, already well diffused; its splendid crimson flowers, produced in great abundance; are frequently 6 inches across. The seed could never be found ripe.

H. mutabilis, Linn., Changeable rose.

Common; flowers in October.

H. Cooperi, hort.

Ornamental variety with rose-colored margins round the leaves; introduced 1874, and found to grow readily at Mount Langton.

H. Bancroftianus, Macf.

Variety with thick fleshy, glossy, crenate leaves, which flowers rarely. At the public buildings and elsewhere.

H. populneus, Linn.

In the Cove at Clarence Hill, and elsewhere.

H. esculentus, Linn. Okra.

Is cultivated in gardens, and by some persons relished as a vegetable, of whom the writer is not one. *Abelmoschus esculentus* W. A.

Gossypium herbaceum, Linn. Cotton plant.

Originally from the East Indies. Cotton of this species was both grown and spun in Bermuda, in the last century, as it still is in India and Southern Europe. Old plants are to be met with, nearly small trees. The down is not now put to any economic use, and is superseded, for economic purposes, in the United States, by *G. album*, Wight., and *G. nigrum*, Hamilt.

Thespesia populnea Correa.

In a garden at St. Georges, where it is known as Gamboge tree by some original misapplication of the name.

Althæa rosea, Cav. Hollyhock.

Met with in gardens occasionally, of poor varieties.

Bombax ceiba, Linn. *id.* Silk cotton tree.

There are several of these trees at Mount Langton, planted by Governor Reid; flower has not been observed on any. Young trees are met with elsewhere. (*Eriodendron anfractuosum*, DC.) native of West Indies; introduced by Sir W. Reid, about 1845.

XXI.—STERCULIACEÆ.

Sterculia Carthaginensis, Cav.

To be found in the old garden at Spanish Point (Mr. Shaw Wood's), where are several other rare trees, native of Continental America. It may be recognized by its unusually large palmate leaves.

Waltheria Americana, Linn.

Native, found in Pembroke marsh and on the hillside. From A. F. Walther, a botanist of Leipsic.

Guazuma tomentosa, H. B. Bastard Cedar of West Indies.

There is a healthy tree in the officer's garden, St. Georges.

XXII.—TILIACEÆ.

Triumfetta althæoides, Lam.

T. semitriloba, Linn., Burr or Boor bush.

A very common plant in the Walsingham tract; native, becomes a largish bush.

T. Lappula, Linn.

After Triumfetti, a botanist.

XXIII.—LINACEÆ.

Linum usitatissimum, Linn. Wild flag.

Plants are to be found naturalized in Pembroke marsh. It is mentioned as early as 1632, but does not appear to have ever been much cultivated. Probably from a Celtic word Llin, signifying thread, running through many languages.

XXIV.—GERANIACEÆ.

Oxalis cornua, Thunb. Sorrel.

O. microphylla, Poir.

With small, yellow flowers.

O. corniculata, Linn., var. *stricta*, Sav. Yellow wood-sorrel.

With largish, yellow flowers.

O. violacea, Linn. Purple wood-sorrel.

Also American.

XXV.—MALPIGHIACEÆ.

Malpighia setosa Speng. French cherry?

Prof. Oliver remarks: "This may be what Grisebach calls *M. punicifolia*, Linn. A large, bushy tree, by the officer's library, north of the Hospital Prospect, and at Mr. Zuills, Smith's parish. Introduced in the last century. It flowers in June.

XXVI.—ZYGOPHYLLEÆ.

Guaiacum officinale, Linn. Lignum vitæ.

To be found in gardens. From Guaiac, the native name in Guiana.

Melianthus major, Linn. Honey Flower.

Luxuriant in the garden at Mount Langton. Originally from the Cape of Good Hope.

Pelargonium sp. Double geranium.

The climate and soil of Bermuda seem to suit the double varieties of *Pelargonium* remarkably well; these beautiful flowers are therefore very abundant, and of many shades, but chiefly scarlets. Of cultivated hybrids which are continually varying, the number and variety is considerable; but it is rare to see a geranium which would attract notice at the humblest flower show in England or America. This is more the consequence of want of skill in cultivation than the fault of the climate, but the plants straggle and run to wood in a vexatious way.

Pelargonium ———. Stork's bill; Sweet-scented geranium.

Is completely naturalized, but not to be found far from the neighborhood of houses and gardens. Its bright pink flowers and sweet-scented leaves are among the pleasures of the islands.

Geranium dissectum, Linn. Wild Crane's bill.

Quite naturalized on David's Island, originally British.

G. pusillum, Linn.

A smaller wild geranium. Also British.

Impatiens balsamina, Linn. Balsams; Snapweed.

An annual, cultivated in gardens, originally from the East Indies.

XXIX.—RUTACEÆ.

Quassia amara, Linn. Quassia.

Introduced at Mount Langton from the West Indies in 1874, and grew well, but had not flowered in 1877.

The name immortalizes Quassi, a negro slave of Surinam, who made known the medicinal properties of one of the species.

Ailanthus glandulosa, Desf.

Originally from China. Introduced by Governor Elliott. The finest trees are at the public buildings, Hamilton.

Xanthoxylum Clava-Herculis, Linn.

A single tree of about 10 inches diameter on a hill east of Paynter's vale. Easily known by the large pellucid points in the leaflets and their strongly aromatic taste. Although this tree was the object of numberless visits at all seasons, the writer could never find fruit or flower; nevertheless there are a few seedlings to be found among the *Sage* and *Sponia* bushes around.

According to one tradition this tree, now 30½ inches in girth, was planted about a century ago by a Mr. Paynter, and has not increased in size within memory; it does not however look an old tree. The writer inclines to believe that it is a last survivor of the native "yellow wood" frequently mentioned in the first accounts of the island.* Every endeavor to transplant young plants failed, owing to the impossibility of extricating their long tap root unbroken from the crevices of the rocks.

Citrus Limonum, Risso.

The common wild lemon, berry ovoid, tubercled or rugulose; very acid; leaf-stalks with scarcely any trace of a winged margin. (*C. spinosissima*, Rein.)

Var. called Pumpnosed lemon.

Var. with smooth skin of small size, 1¼ to 1½ inches in diameter and nearly globular. *C. limetta*, Risso.

Var. with smooth skin, of larger size, ovoid, called the Lisbon lemon.

---

*"The timber of the country consisteth of three sorts; the one is the cedar; very fine timber to worke upon, of color redde, and verie sweete; the other sorts wee have no name for, for there is none in the company hath seen the like in other countries before wee came: some did thinke it to be *lignum vitæ* but it is not soe, it is a verie fine wood, of colour yellow, and it bears a leaf like unto a walnut tree, and the rine or barke is is much like a walnut tree, and the barke if one taste of it will bite one's tongue as if it were Ginney Pepper. That wood also is very sweet."

This description applies closely to Xanthoxylum. Professor Oliver, writing from Kew in October, 1872, having only leaves before him, remarked: "The leaves, strongly translucently dotted, without flowers, must belong to a species of *Xanthoxylum*, and agree fairly with a flowerless Dominica specimen, which has been queried as *X. aromaticum* but the species must remain doubtful until we have flower and fruit, which we shall be particularly obliged for." The visitor, therefore, who shall be so fortunate as to find the tree in flower, will help to solve a problem of unusual botanical interest.

Citrus Bigaradia, Loist. Bitter orange.

Berry large, orange-colored, smooth, bitter, and acid; a beautiful fruit in appearance; the flower is also very large and highly perfumed; leaves large, dark, and glossy. A handsome tree.

Citrus vulgaris, Risso. Seville orange.

Citrus Aurantium, Linn. Sweet orange.

Occasionally weighs over 1 pound, and is of excellent flavor. The best were in 1876 grown at Spanish Point.

Citrus nobilis, Lour. Mandarine orange.

Mandarine oranges of large size, and the finest quality, were produced by one tree at Mount Langton, but the fruit is not much met with.

Citrus nobilis, Lour. *var. minor*. Tangerine oranges.

Also rare in the Islands.

Citrus decumanus, Linn. Shaddock.

Grown at Somerville and elsewhere.

Citrus racemosus, Ris et Poit. Grape fruit.

So called from being produced in bunches. The trees may be distinguished by the very large, heart-shaped wings on the leaf-stalks.

Citrus buxifolia, Poir. (*C. Paradisi*, Macf.) Forbidden fruit.

A variety of the Shaddock, and rarely met with.

Citrus Medica, Linn. Citron.

Rarely met with.

Glycosmis pentaphylla var. *citrifolia*, Lindl.

In some gardens.

Oranges, formerly very abundant in Bermuda, and of excellent quality, have of late years comparatively died out. The quantity grown is nothing like equal to the local demand, and such extravagant prices as 3 shillings or even 4 shillings a dozen are sometimes asked for fine ones. This unfortunate result is due to a disease to which the trees are subject, to general horticultural neglect, and to the preoccupation of the good soil by more remunerative crops. The trees suffer extremely from a white coccus, with knobs or prominences on the exterior shell, which sometimes covers the entire surface of the shoots and large portions o the leaves. The writer often had them brushed off small trees; and th twigs and leaves well syringed, to their great advantage, but a few weeks brought them back, and no systematic attempt is made to kee down this plague, which is equally injurious to several other trees; fo example, the Eugenia, the Avocada Pear—even the Cycas and the Yucca. The creature, in fact, seems capable of deriving nourishment from the leaves or tender bark of nearly every description of plant. The insect form is entirely obliterated in the old females, which become mere shells full of eggs. The writer once found a negro engaged in laying bare the roots of some orange trees on Trunk Island, and learned that his object was to apply in some way whale oil to them. In general, however, the trees are suffered to run wild, little care is taken to prune them, or to cut out dead wood, or to free branches which intersect, excoriate, and choke each other, and few young trees are planted. On all these accounts Bermuda can never rival Florida, where the orange is now grown on the largest scale of farming, with all the resources of horticultural skill; but the fruit might be much more abundant than it is for the benefit of the inhabitants.

The Bermuda Company sent out orange, lemon, and citron seeds in 1616.* In 1621 the governor was able to refresh a shipwrecked party with the fruit,† and from 1634 we find examples of rents paid in oranges and lemons.‡ Sir W. Reid, among his many beneficial measures, procured great quantities of young plants for distribution from Madeira about 1846, and bore strong testimony to the excellent quality of the fruit of the island growth.

Triphasia trifoliata, DC.

To be found as a low creeping bush in some gardens. Introduced.

Murraya exotica, Linn. Martinique Laurel.

A very ornamental shrub, not uncommon in gardens. Introduced from West Indies.

Cookia punctata, Retz. Wampee.

In a few gardens. Introduced by Governor Elliot.

XXXI.—MELIACEÆ.

Melia Azedarach, Linn. Pride of India; in the United States, Pride of China.

A short-lived tree, worthless as timber, but valuable for shade and for the beauty of its flowers. Introduced from Charleston, South Carolina, about 1782. The *Melia* loses its leaves for a few weeks in winter. Flower begins to appear in February. It has astonishing powers of vitality in transplantation, and is popularly supposed to afford a cooler shade than any other tree. Originally from Asia Minor.

---

* I., p. 117.

† I., p. 158.

‡ I., p. 405.

Swietenia mahagoni, Linn. Mahogany.

There is one conspicuous and well-known tree at the Flatts; but a few young trees are met with. Introduced from the West Indies.

Chloroxylon Swietenia, Linn. Satinwood.

Some young trees introduced from the West Indies at Mount Langton.

XXXII.—ILICINEÆ.

Ilex Cassine, Walt. Holly; Box; South Sea Tea.

This plant is now pretty common, especially near the Flatts, and in Smith and Hamilton Parishes, where it was introduced from Virginia by a Mr. Peniston in the last century. The bright red berries are much sought after for Christmas decorations. (*I. vomitoria*, Ait.)

I. aquifolium Marsh. English Holly.

Was to be found in the garden of Mr. Ayland, St. George's, apparently flourishing. *Ilex* is a word of disputed etymology.

XXXIII.—CELASTRACEÆ.

Elæodendron xylocarpum, DC. Olive wood Bark (*E. orientale* in Lane's list.)

A very interesting native tree, repeatedly alluded to in old laws, where, however, it is confused with *Conocarpus*, *q. v.* The astringent properties of the bark marked it out for the purposes of the tanner, and it was necessary as early as 1650 to restrain persons from unlawfully cutting it. It is now found only in the Walsingham tract, and but little of it left there. Flowers in March and April. Name from *elaia*, an olive, *dendron*, a tree, Gr.; to which, however it has very little resemblance.

Myginda Rhacoma, Sw.

A native shrub, bearing a small eatable berry, found only in Southampton Parish, of West Indian origin, but found also in Florida. The fruit is ripe in January; probably, therefore, flowers in the autumn. Name from Mygind, a botanist.

Euonymus Japonica, Linn.

A shrub found in gardens pretty commonly.

XXXIV.—RHAMNEÆ.

Colubrina Asiatica, Brongn.

Found growing on St. David's Island by Dr. Greenwood, R. A.

Phylica odorata, Cass.

Identified in 1873; no note of its place of growth.

XXXV.—AMPELIDEÆ.

Vitis vinifera, Linn. Grape-vine.

"Vynes and vyne cuttinges" were furnished to the first settlers in Bermuda in 1616. Probably white grapes from Spain; at least such are the oldest vines extant, and from the general resemblance which the climate of Bermuda bears to that of Madeira, which is especially close from November to May, the founders of the colony doubtless anticipated a similar success in their cultivation; in this, as in so many other expectations, they were disappointed. Very fine grapes have been grown in Bermuda, but not in great abundance, and the climate is too near that of the West Indies, where the vine does *not* succeed, to be considered favorable to it. The soil is also generally too poor.

The vine loses its leaves in November, and begins to recover them in February. The interval of rest has not been observed with much accuracy, but does not appear to exceed 120 days. It is given by DeCandolle as 157 days at Medeira.*

The writer imported and distributed a great number of the best English hot-house varieties, especially Black Hamburgs and Muscats of various denominations, and they bore in Mount Langton Garden, when only 3 years old, fruit which as to flavor left nothing to be wished; the best bearing vine, however, was one transplanted out of an old garden where it grew in a marsh. It was layered in marshy ground, where the water habitually stood, in a ditch close alongside the trellis, at 6 to 12 inches only below the level of the soil, having a mean temperature of about 21° C. (70° Fahr.). Under these singular circumstances it produced very fine and highly-flavored fruit, akin to Black Hambro', but redder in color. The bunches, however, rarely reached 1 pound, but single berries were often an inch in diameter.

These vines were skillfully pruned, the bunches thinned, and the berries also thinned, by an English gardener. In general, vines in Bermuda are left entirely to nature. It is customary to let them run over a horizontal trellis for shade, but they are scarcely ever touched with the knife, and never manured—a neglect which fully accounts for the poor quality of the fruit.

---

* Géographie Botanique, 1855, I., p. 47.

An interesting example of the diffusion of plants was afforded by the foundering of the ship Minnie Breslauer, on January 6, 1873, on the south shore. She had a cargo of white Lisbon grapes, many of which were washed on shore and germinated at high-water mark. Numbers of plants were, from curiosity, taken up and transplanted, some of which bore fruit in 1876.

The vine flowers in February; bears in July.

The following comparison of the approximate mean temperature of the vine-growing region of Madeira (below 2,000 feet) with that of Bermuda (below 200 feet) makes the essential difference of the two climates very apparent.

Month	Madeira.	Bermuda.	Month.	Madeira.	Bermuda.
January	61. 9†	63. 8‡	July	64. 4* to 70. 1†	80. 3‡
February	62. 7†	63. 0‡	August	65. 5* to 71. 0†	81. 7‡
March	64. 0†	63. 3‡	September	65. 8* to 70. 9†	79. 8‡
April	56. 3* to 67. 1†	66. 5‡	October	63. 0* to 68. 7†	73. 7‡
May	56. 7* to 68. 4†	70. 4‡	November	59. 5* to 65. 0†	68. 6‡
June	60. 2* to 68. 2†	76. 0‡	December	62. 6†	64. 3‡

*DeCandolle, Géogr. botanique, I, p. 387. These are the approximate temperatures at the upper limit of 60°, or 2,000 feet.

†Temperatures toward the sea-level or at the lower limit, from Dr. M. C. Grabham, on the Climate and Resources of Madeira, 1870.

‡By interpolation.

Ampelopsis quinquefolia, Michx. Virginian creeper; Sarsaparilla.

This plant is to be found wild about the caves of Walsingham.

Ampelopsis tridentata, Thun.

Introduced in 1875 and doing well at Mount Langton.

Cissus discolor, Blum.

This beautiful creeper flourishes with great luxuriance at Mount Langton, under glass, losing its leaves regularly in the winter. A specimen was also found in a garden at Saint George's, unprotected, but it barely lived through the winters.

XXXVI.—SAPINDACEÆ.

Cardiospermum Halicacabum, Linn. Small shot.

This pretty little creeper is common in the Walsingham tract, and rarely met with elsewhere; native. Common to Africa and America.

Cupania fulva, Mart.

A single tree is to be found at Spanish Point, where it flowers very freely in July; native of the West Indies. Introduced.

Blighia sapida, Kœn.

A tree of the West Indies; originally from West Africa. In the garden at Par-la-ville; flowers in July. Fruit ripe in November.

Sapindus Saponaria, Linn. Soapberry.

In a few gardens; flowers in November.

S. longifolius, Vahl.

At Mount Langton; a small tree which had not flowered down to 187

Dodonæa viscosa, Linn. Broom; Dogwood.

Pretty generally diffused; abundant at the east end of Harrington Sound; may be known by its highly colored, winged seed-vessels; flowers in March. Identified by Grisebach and Dr. Rein as *D. angustifolia*, Lam. Possibly both specimens are found; named after Dodoens, a botanist.

Nephelium Litchi, Lour. Lee-chee or Litchi.

Introduced by Governor Elliott about 1853.

A tree at Mount Langton bore abundantly in 1871; flowers about February. Fruit in August. (*Dimocarpus Litchi*, Lour.)

Koelreuteria paniculata.

A native of China. Introduced. The locality in which it was found has not been noted.

Pavia, sp.

A tree in the grounds of Mrs. Ewing, Hamilton, digitate leaves, which has never flowered; appears to be *Pavia humilis* of the Horse-chestnut family.

XXXVII.—Terebinthaceæ.

Rhus Toxicodendron, Linn. Poison ivy.

Native, and among the plants mentioned by the earliest travelers (1623). Common in good soil, and viewed with much dread by the inhabitants. Different constitutions are susceptible in very different degrees to the poisonous emanations of this plant; many persons can handle it and smell the flowers, which are very fragrant, with impunity; others have painful blisters produced on the face and hands by going near it, and, as is sometimes asserted, without being conscious of its presence.

Rhus [illegible], Thunb.

Raised from Cambridge, Mass., 1875.

Rhus juglandifolia, Willd. Walnut-leaved Rhus.

A native of Nepal. Introduced at Mount Langton from the West Indies, 1875, and well established.

Schinus molle, Linn. Spanish pepper.

A native of Peru; raised from seed received from Gibraltar, and well established.

Mangifera Indica, Linn. Mango.

The mango is a fruit in Bermuda. A tree at Mount Langton bears abundantly. Introduced by Governor Elliot. Flowers February to April; fruit, August and September.

XXXVIII.—LEGUMINOSÆ.

Ulex Europæus, Linn. Gorse or furze.

Raised in quantity from seed, about 1874, at Mount Langton, where it established itself and flowered freely for a year or two, but did not make continuous healthy growth. The climate is probably too hot for it so near the sea level. Its first introduction is due to Mr. J. M. Jones.

Medicago lupulina, Linn. Black Medick clover.

A common weed in pastures everywhere. Cattle only eat it when they are forced by hunger. It is mentioned by Michaux in 1808.

M. maculata, Willd.

M. muricata, All. With.

A common running weed, which covers large circular patches of ground, recognized by its prickly, coiled seed-vessels.

M. denticulata, Willd.

Indigofera tinctoria, Linn. Indigo.

Introduced for commercial purposes early in the seventeenth century, and now naturalized. It is mentioned as indico in 1623. There is no evidence that it was ever cultivated to profit.

Spartium junceum. Spanish Broom.

Raised from seed at Mount Langton, and flowered, but never established itself.

Aeschynomene, sp.

A species not determined; is to be found at Paynter's Vale. It resembles a small mimosa.

Desmodium virgatum, Desv. (*Hedysarum virgatum*, Hamilt.) An herbaceous plant; to be found along the South Shore road in Devonshire Parish.

D. gyrans, Linn.

Was grown at Mount Langton.

Arachis hypogœa, Linn. Peanut or Earthnut.

Cultivated in a few gardens. Introduced from America.

Cajanus Indicus, Spreng. Pigeon pea.

Not uncommon, and occasionally eaten by the colored natives. Introduced from the West Indies.

Cytisus Laburnum, Linn. Laburnum.

Plants were raised from seed in 1872, but did not thrive.

Melilotus officinalis, Willd. Melilot.

Very common in cultivated grounds; of little value. Cows will eat it, but the patches are left untouched if there is other food.

Melilotus alba, Lam.

M. parviflora, Desf.

Trifolium pratense, Linn. Red clover.

One of a great variety of fodder plants; tried extensively on low ground at Mount Langton, 1875–'76, where it answered better than any other, and might be cultivated to advantage in parts of Pembroke marsh.

T. repens, Linn. White clover.

Similarly tried; did not appear to answer so well as red clover.

Robinia Pseudacacia, Linn. Common acacia; locust.

Introduced from the United States; there are well grown trees at the public buildings, Hamilton. (*R. dubia*, Fonc.)

Hedysarum Onobrychis. Saintfoin.

Said to be occasionally grown; but the writer never met with it. From Malta.

Wistaria frutescens, Poir. Wistaria.

A native of the Southern United States. Introduced at Mount Langton, 1874, where it flowered in April, 1877, but the plants did not make healthy growth; the soil was, perhaps, too light and calcareous.

Hardenbergia digitata, Lindl.

Raised from West Australian seed and established at Mount Langton; it flowers in April and May.

Vicia sativa, Linn. Vitch or tare.

A weed in pastures.

Lathyrus odoratus, Linn. Sweet pea.

Cultivated in gardens.

Pisum sativum, Linn. Common pea.

Cultivated in gardens, but to no great extent. An American variety called the Bird-eye pea, sown in June and July, is grown generally for fodder.

Phaseolus vulgaris, Linn. Kidney bean; French bean.

One of the most valuable products of the vegetable garden, and much grown.

Phaseolus sp.

A species not identified.

Ceratonia tiliqua, Linn. Locust.

This tree is not uncommon, but, no attention having been paid to the subject, nearly all the individuals appear to be male trees, especially in and about Hamilton; the fruit is consequently uncommon. Female trees may be found in Hamilton parish; flowers in June. Probably introduced in the present century.

Clitoria Ternatea, Linn. Blue pea.

Introduced at Mount Langton from the West Indies, 1873, but a native of India; single and double flowering, and naturalized, seeding abundantly.

C. Brasiliana, Arrab. Purple flowering pea.

Introduced at the same time; both plants are naturalized.

Centrosema Virginianum, Benth. Spurred Butterfly pea.

In Dr. Rein's list.

Vigna luteola, Benth.

Introduced from the West Indies, at Mount Langton, and naturalized; seeding abundantly.

Dolichos Lablab, Linn.

A beautiful variety with purple veins is to be found in some gardens at Saint George's; perhaps *D. purpureus*.

Another at Mount Langton.

Canavalia obtusifolia, DC. Bay bean.

Native, and to be found mixed with *Ipomea pes capræ* along the south shore; flowers in December. It is mentioned as early as 1623.

Psoralea glandulosa, Linn.

Sent from Cambridge in 1874. Doing well in 1877.

Balsamocarpon brevifolium, Chois.

A packet of seeds of this valuable plant was received from Kew in April, 1875. They germinated, but the young plants were all in succession attacked by some insect and none of them survived.

Adenocarpus telonensis, DC.

Introduced from Cambridge, Mass., 1874, and living 1877.

Argyrolobium androsæmifolium.

The same remark.

Anthyllis Barba-Jovis, Linn.

The same remark.

Tamarindus Indica, Linn. Tamarind.

To judge from the size of the oldest trees, the Tamarind must have been introduced a century ago. One of the finest trees in the Islands is a Tamarind at Point Shares, which is 9 feet 6 inches in girth. One at Brightwood is said to be 14 feet in girth. No use is made of the fruit. This is but one of many examples of the neglect of minor industries by the natives of Bermuda. Preserves are imported, notwithstanding the abundance of native fruits suitable for making them.

Seeds of the great leguminous climber of the West Indies, *Entada scandens*, Benth., are often washed ashore in Bermuda, but the plant is not known to have ever grown.

Cæsalpinia pulcherrima, Sw. Barbadoes' Pride.

Barbadoes flower-fence, at the rectory, Southampton Parish, and elsewhere; naturalized in the West Indies; originally from the East Indies. (*Poinciana pulcherrima*, Linn.) Flowers in August.

Poinciana regia, Boj. Poinciana.

There are many trees about Hamilton. Two or three that were raised from the seed of 1870, in Mount Langton, first flowered in 1878. The leaflets are smaller and much more numerous than in the preceding species. Originally from Madagascar.

Cæsalpinia elata, Sw.

Was raised from seed brought from Turk's Island, in 1872, by Mr. Wingood, and flowered the third year; flowered in June. Originally from India.

Cæsalpinia Gilliesii, Wall.

Introduced from Cambridge, Mass., in 1874. Had not flowered in 1877. Originally from South America.

Colutea arborescens, Linn. Bladder senna.

Raised from seed sent from Kew, 1872, and flowered in Hamilton.

Erythrina velutina, Willd. Locust.

Several old and very large trees exist; the largest, now fallen, is at Mr. R. Tyne's, Devonshire Parish; the largest sound tree at Mr. Somers Tucker's, Smith's Parish. It is 12 feet round 6 feet from the ground, the huge roots allowing no nearer measurement. This tree does not in the least agree with the early description of the "yellow wood." But the wood has a strong tinge of yellow, and is employed on that account for inlaying. There is reason to think that it was formerly known to the inhabitants, as it is still to the soldiers, as the "yellow wood;" for in a map of Ireland Island, in the British Museum, dated 1694, a "yellow tree" is inserted as a landmark near the present site of the captain superintendent's house (N. side of his cove). The original or true yellow wood, however, is never mentioned by Norwood or late writers, as it probably would have been if known to them; and I infer that the yellow tree of 1694 was a "locust." The flowers are orange red, and appear in April. (Add. MSS. 5,415, G. 14.)

Erythrina, sp.

A large specimen at Mount Langton, passing as *Erythrina indica*, Lam. The seeds are, however, scarlet, whereas those of *E. indica* are black. It differs but little from the last, but the flowers are dark scarlet, the leaflets further asunder and more acute, petioles longer. It flowers from February to April, the first flowers preceding the leaves, which are very umbrageous.

Erythrina speciosa, Andr. Sword plant.

The *Bois immortelle* of the French West Indies, called by Dr. Rein *Catalpa corallodendron*, L. Seeds scarlet. The most common species in Bermuda. The wood is yellow, and it might be supposed to have been the "yellow wood" of 1694 but for the fact that it was first introduced by a gentleman still living, Mr. R. R. Darrell, about fifty years ago.

Erythrina cristægalli, Linn.

Only one specimen known, which is in a garden, formerly Mr. Kennedy's, Hamilton.

Erythrina caffra, Thunb.

Caffra-brom was raised from Cape seed, but had not flowered in 1877.

E. Corallodendron and *E. herbacea* were imported, but had not flowered in 1876.

Sophora tomentosa, Linn.

Native, and to be found sparingly along the southern shore and on Smith's Island; common in the tropics. The name is from the Arabic.

S. Chinensis, Todd.

Some plants received from the botanical gardens, Cambridge, Mass., did not thrive.

Myrospermum perniferum, D. C.

Introduced by Governor Reid, about 1846. A fine flowering tree at Mount Langton; others elsewhere.

Guilandina Bonducella, Linn. Nicker tree.

Native, but found only once in the Walsingham tract, in April, 1874, when it was in flower.

Pithecolobium Saman, Benth.

Plants received from Barbadoes grew at Mount Langton. (*Calliandra Saman*, Gr.)

Cassia Fistula, Linn.

A fine tree on War Department property, above naval wells; introduced from the West Indies.

C. bacillaris, Linn.

At Mount Langton; easily recognized by having only 4 leaflets.

C. bicapsularis, Linn. Christmas bush.

A climbing variety common in fences.

C. glauca, Lam. West Indian Ash.

At Somerville and Par-la-ville.

C. ligustrina, Linn.

Common in gardens; distinguishable by the very pointed leading leaflets, like Privet, whence the name.

C. occidentalis, Linn.

An annual weed in some gardens, especially at St. Georges.

C. corymbosa, Lam.

Introduced at Mount Langton from the United States, and flowered, but, being in a poor soil, is not likely to survive long.

The only species of *Cassia* quite naturalized is of a climbing habit, locally called the Christmas bush, having but 6 fertile stamens; here queried as *C. bicapsularis*, Linn.

Brownea grandiceps, Jacq.

Introduced from the West Indies at Mount Langton, 1875, and left thriving in 1877, but had not flowered.

Casparea porrecta, Kth. Napoleon's plume; often called *Bauhinia.*

To be found in gardens; a quick, growing, very ornamental shrub; flowers in May or June.

Bauhinia parviflora, Vahl.

A tree at the Model Farm, Smith's Parish; flowers in June.

Bauhinia Vahlii, Wight.

A beautiful white flowering variety, introduced from the Botanical Gardens, Trinidad, 1874; flowers freely at Mount Langton in June, and ripened seed.

Desmanthus virgatus, Willd. (*Desmodium virgatum*, Desv.)

Native; a shrubby plant to be found along the South road sides, in Devonshire Parish.

Mimosa pudica, Linn. Sensitive plant:

Raised from seed, and naturalized at Mount Langton.

Leucæna glauca, Benth. Wild mimosa.

This pest is by no means so generally distributed in Bermuda as its extraordinary prolific qualities would have secured if its introduction had been at any remote date. It is given without remark by Dr. Rein, and is probably of recent introduction; but as the inhabitants cannot be aroused to any adequate sense of the duty of extirpating it, there cannot be a doubt of the serious nuisance it must soon become. It is a plant which is capable of deriving nourishment from the poorest soil, and sends its long-tap root to a distance of many feet. It flowers and ripens seed nearly all the year around. Every seed seems to germinate. The writer has pulled out 300 seedlings from a space of one square yard. The ground at length becomes so full of them as to destroy all other vegetation.

Acacia macracantha, Humb. Bonpl.

Self-sprung from some West Indian soil at Mount Langton in 1874. It was suitably transplanted, and became a flourishing young tree, easily recognized by its fine foliage and very minute leaflets.

A. Arabica, Willd. Gum Arabic; Yellow mimosa

A yellow flowering acacia, not uncommonn in gardens.

A. cygnorum, Meissn.

Was raised from seed received from West Australia, and flowered for a year or two at Mount Langton, but proved unable to stand the high winds.

A. Lebbek, Willd. Black ebony

Very fine trees are to be seen at Peniston's, Smith's Parish, the largest 66 inches round, but it is not uncommon elsewhere. Flowers in July. It loses its leaves in winter. Originally from the east; probably introduced from the West Indies in the last century. (*Albizzia Lebbek*, Benth.)

Inga vera, Willd.

Tried at Mount Langton, from the West Indies. The plant languished for three or four years, but never made healthy growth.

XXXIX.—ROSACEÆ.

Chrysobalanus pellocarpus, Mey. Pork-fat apple.

In Mrs. Reed's and Mr. H. Trimingham's gardens. Flowers in July. Bears a purple fruit the size of a plum, the taste of which is very well described by its local or West Indian name.

Photinia arbutifolia, Lindl.

This Californian shrub was sent from Cambridge, Mass., in 1874, and doing pretty well in 1877.

Prunus domestica, Linn. Plum.

Trees from Baltimore (Washington and Wilson's purple) were planted at Mount Langton in 1872, but did not bear fruit.

P. Armeniaca, Linn. Apricot.

The same result followed with apricots, and both are apparently unsuited to the climate of Bermuda, but specimens of the latter have been produced by Hon. E. Harvey, in Paget Parish.

P. occidentalis, Sw. West Indian plum.

P. sphærocarpa, Sw.

Specimens from Trinidad planted at Mount Langton in 1872 came to nothing.

Amygdalus Persica, Linn. Peach.

Formerly a very abundant fruit, but of late introduction; the trees are still numerous, but have been for about 20 years so infested by the American fly that the fruit may be considered extinct; a specimen not spoiled by the disease is nearly unknown.

The first peach trees that bore in Bermuda are said to have been raised in St. David's Island by a retired officer, Lieutenant Lang, from Madeira seeds. There had been American trees raised previously, but they bore no fruit—a result which followed the importation of a number of trees from Baltimore by the writer.

A. nectarina. Nectarine.

The same remark as to the apricot above.

A. communis, Linn. Sweet almond.

The same remark again.

A. amara, Hort. Bitter almond.

The same.

These trees were, however, unfortunately planted in bad soil at Mount Langton.

Fragaria Virginiana, Duchesne. Strawberry.

Wild strawberries have been found in Paget Parish, probably escaped from gardens. The fruit is but little grown, and generally from plants procured from Newfoundland, which begin to bear about New Year's day; at Mount Langton once as early as the end of November (1872), and as late as June (1874). The plants require renewal every second year. A much larger variety has been successfully raised at Clarence

Hill, from New York plants. There is nothing to prevent the fruit being abundant.

Rubus idæus, Linn. Raspberry.

It is clearly established that Bermuda is beyond the southern limit of this native American plant. It was perseveringly tried by Governor Lefroy and Hon. Eugenius Harvey, 1872–'76, and fruit actually produced by the latter, but the plants could not be kept alive.

Spiræa prunifolia, Sieb.

S. salicifolia, Linn.

Both species are to be found in gardens.

Geum radiatum?, Michx.

A common yellow-flowering weed in fields.

Rosa Carolina, Linn.

Tried with the like result.

R. lævigata?, Michx. Wild rose.

Naturalized in Pembroke marsh and in the Walsingham tract.

R. lutea, Brot., var. *Puniceæ*. Austrian briar.

Introduced from Cambridge, Mass, 1874, and very healthy 1877.

R. rubiginosa, Linn. Sweet briar.

Is found in gardens.

R. spinosissima, Linn.

R. Damascina, Linn.

The varieties cultivated in gardens are numerous, and embrace most of the common favorites; the flower is abundant, but from want of horticultural skill is rarely seen in high perfection. Many of the best species were from England and America introduced at Mount Langton, 1872–'76. The moss rose (*R. centifolia*, Linn.) does not succeed in Bermuda. White roses are in great profusion; as many as 2,000 blooms have been used in the Easter decoration of Trinity Church alone.

Cratægus pyracantha, Pers. Hawthorn.

At Camden and Mount Langton; but of a great number of species tried to be raised from seed in 1872, none succeeded in establishing themselves.

Pyrus Malus, Linn. Apple.

A few apples are grown in Bermuda, of an indifferent quality, and rather as a curiosity than for use. A tree in Mr. Jackson's garden, Hamilton, is the most regular bearer; flowers February and March. A number of trees were planted at Mount Langton in 1872 and flowered, but never produced fruit.

Pyrus communis. Pear.

Pears have been produced, especially by Hon. Eugenius Harvey, 1876, but the tree does not succeed. Of 18 trees from Baltimore, planted at Mount Langton, 1872–'76, not one bore fruit or made healthy growth. They were of 7 varieties.

Cydonia vulgaris, Pers. Quince.

Tolerably common, in moist ground, and bears pretty well. The tree degenerates to a straggling bush, and flowers irregularly in April and May.

Eriobotrya Japonica, Lindl. Photinia. Japan medlar.

Introduced from Malta by Sir W. Reid, about 1850, and now very common. It flowers about September; the fruit is ripe in January, and in good soil and sheltered situations is excellent.

XL.—SAXIFRAGEÆ.

Hydrangea hortensis, Sm.

The *Hydrangea* is almost unknown in Bermuda, although so common in Madeira. Imported plants rarely flower well, and soon die off, probably for want of moisture at the roots.

XLI.—PHILADELPHEÆ.

Deutzia scabra, Thunb.

Grown in gardens.

XLII.—CRASSULACEÆ.

Bryophyllum calycinum, Salisb. Lip plant.

One of the commonest weeds. First introduced into Bermuda as a curiosity by a Captain Stowe, in 1813, but now naturalized everywhere. From *bryo*, I grow; *phyllon*, a leaf; Gr.

Echeveria gibbiflora, DC., var. *metallica*.

Introduced at Mount Langton, 1872, from Kew, and becoming common.

Kalanchoe, sp.

The same note.

Sedum acre, Linn. Stone crop.

Introduced at Mount Langton; this class of garden plants is, however, scarcely known in Bermuda.

XLIII.—RHIZOPHOREÆ.

Rhizophora Mangle, Linn. Mangrove.

Abundant in salt marshes everywhere; flowers in February. From *rhizon*, a root; *fero*, I bear; Gr.

XLIV.—COMBRETACEÆ.

Terminalia Catappa, Linn. Demerara almond.

Some fine trees at Mount Langton; flowers in June; named from the terminal leaves.

Laguncularia racemosa, Gært.

Native along the shore (*Conocarpus racemosus*, Linn.). Common to Southern United States and West Indies.

Conocarpus erectus, Linn. Sea mulberry; often called bark; button-tree; or alder.

Native, and universal along the shores in suitable places. Common to the Southern United States and to the West Indies; flowers in July. From *konos*, a cone; *karpos*, a fruit; Gr.

XLV.—MYRTACEÆ.

Jambosa vulgaris, DC. (*Eugenia Jambos*, Linn.) Rose apple.

To be found in a few gardens only. Flowers about March. Fruit ripe in June.

Eugenia axillaris, Poir., *ib. loc.* Stopper.

Native. Common in the Walsingham tract, and occasionally met with elsewhere, *e. g.*, at Point Shares. It flowers in September. This plant is peculiarly infested by the white coccus, and rarely has a healthy appearance. It is hard to find flower or berries.

E. uniflora, Linn., *ib. loc.* (*E. Michelii*, Lam.) Surinam cherry.

Naturalized, and common in gardens; both flower and fruit may be found in nearly every month of the year, but flowers chiefly February to May. In good soil the trees bear a very agreeable fruit, but it varies much in quality. Trees newly introduced from Trinidad, of a thorny variety, were much superior to those of local origin.

E. Malaccensis, Linn., *id.* (*Iambosa Malaccensis*, DC.)
At Par-la-ville, bore for the first time in 1878.

Pimenta vulgaris, W. A., *id.* Pimento; allspice.
At Long House, Hamilton.

P. acris, W. A., *id.* Pimento; allspice.
At Mount Langton, and elsewhere.

The species are easily distinguished, the former having 4, the latter 5 lobes to the calyx; flowers in June.

Psidium Guaiava, Rad. (*P. pomiferum*, *P. pyriforme*, Linn.) Guava.
Probably native, as it springs spontaneously, and is to be met with quite wild. It bears capriciously. The fruit is rarely abundant; flowers May, June, on to September. Fruit about December.

P. Cattleianum, Sabin., *loc.* Guava-berry; Governor plum.
In a garden near Paget church.

P. cordatum, Sims., *loc.* Myrtle guava.
At Somerville, in Smith's Parish.

Punica Granatum, Linn. Pomegranate.
Was grown in Bermunda as early as 1621, and probably found there, the introduction of early navigators. It is quite naturalized and often used in fences. Double flowering trees of great beauty are common.

Eucalyptus globulus, Sabil., *id.* Blue gum.
A number of trees were raised from seed in 1873, and one specimen in Pembroke Marsh attained a height of 12 feet, but required support against the winds, which precluded all hope of their being established.

E. resinifera, Smith. Red gum.
A specimen of this species resisted the wind, and appears capable of thriving.

E. coriacea, A. Cum.
A specimen of this species made very poor growth, but continued to live.

XLVI.—LYTHRARIEÆ.

Lagerstrœmia Indica, Linn. "Queen of the Shrubs." Crape myrtle of the U. S.
This very beautiful shrub was introbuced from Caraccas by Capt. J. C. Austen, R. N., and is not uncommon. The largest tree is at Mount

Langton; flowers from May to September. Originally a native of China. There is said to be a white Lagerstrœmia on the island, but the writer never saw it.

XLVII.—ONAGRARIEÆ.

Œnothera rosea, Ait.
Common on roadsides in Warwick Parish, and near Pembroke church.

Œ. longiflora, Jacq., *id.*
To be found along the south shores. Both these are West Indian.

Œ. humifusa, Nutt.
Found near Tucker's Town; a North American specimen.

Œ. sinuata, Linn.
Found on the shores near Shelly Bay; also North American.

Œ. biennis, Linn.

Isnardia repens, DC.
In marshes.

Gaura coccinea, Nutt., Ph.

Fuchsia coccinea, Linn. *id.* Fuchsia.
This plant is but little cultivated in Bermuda, and by no means as common as might be expected. The finer modern varieties are unknown.

XLVIII.—PASSIFLOREÆ.

Carica Papaya, Linn. Papaw.
Common, but not cultivated to any great extent, although it grows quickly and in poor soil. The leaves are popularly believed to have extraordinary curative effects, applied externally in rheumatic cases, and also to make meat tender. There are at least two varieties, originally from South America.

Passiflora laurifolia, Linn. Water lemon.

P. maliformis, Linn. Water lemon.

P. quadrangularis, Linn. Grenadilla. Water lemon.
These are met with in gardens, but the fruit is not abundant.

P. ciliata? Ait. Wild Passion flower.
The wild Passion flower, with 3-lobed, subserrate leaves, like *P. edulis*; glands at the top of the stalk; common about Walsingham and Paynter's Vale; flowers in August. The fruits are locally called apricots.

P. cærulea? Linn.

Wild Passion flower, with 5-lobed leaves, not serrated; the glands more distant from the leaf; appears to flower more rarely. There is said to be another very small wild species, undetermined.

P. edulis? Linn.

A white-flowering species at Mount Langton, introduced from Madeira; bears an oval and quite uneatable berry of very strong taste, nearly as large as an egg.

P. princeps, Todd.

This lovely crimson species flowered with great luxuriance under glass at Mount Langton; introduced from England 1874.

Tacsonia mollissima, H. B., and *T. Van Voxemii*, Funk, were tried unsuccessfully at Mount Langton.

XLIX.—CUCURBITACEÆ.

Sicyos angulatus, Linn. Wild Bryone.

An American species of chance introduction; found about the Church Cave, Paynter's Vale.

Cucumis sativus, Linn. Cucumber.

C. Melo, Linn. Melon.

Cucurbita moschata, Linn., Musk melon, *Citrullus vulgaris* or *Cucurbita Citrullus*, Linn., Water melon, are cultivated in many varieties and plentiful in the early autumn months; also *Cucurbita Pepo*, Linn., Pumpkin; *C. Melopepo*, Linn., Squash; *C. maxima*, Gourd.

L.—BEGONIACEÆ.

Begonia fuchsioides, Hook.

Common in gardens.

B. hydrocotylifolia, Grah.

B. Rex, Pritz.

B. ulmifolia, Willd.

Are all to be found in gardens pretty commonly.

LI.—CACTEÆ.

Melocactus communis, DC. Turk's cap.

Common in gardens; probably brought from the Turk's Islands in the seventeenth century, when they were much frequented by Bermuda salt-rakers. From *melo*, melon and cactus.

Cereus triangularis, Haw. Night-flowering cereus.

C. grandiflorus, Haw.

Both common in gardens. From *cereus*, a torch.

Opuntia Tuna, Mill. Prickly pear.

Native, being mentioned as early as 1610. To be found everywhere. From *Opus*, a city in Greece, where it abounded.

O. tomentosa, Salm. Tall prickly pear.

One aged specimen at Mount Langton is about 15 feet high, and 30 inches round the stem.

O. vulgaris, Haw.

O. Pes-Corvi, Le Conte.

O. Ficus Indica, Mill.

O. coccinellifera, Mill.

Introduced with a view to the cultivation of the cochineal insect, for which, however, the climate is too wet.

The following species were introduced at Mount Langton from the Botanical Gardens, Cambridge, Mass., in 1875, and promised to establish themselves: *Opuntia dejecta*, Salm.; *O. flavicans*, Lemair; *O. integrifolia*, *O. longifolia*, *O. megacantha*, Salm.; *O. tomentosa*, Salm.

Pereskia aculeata, Mill. *id.* Barbadoes gooseberry.

Tolerably common in gardens, but not so much so as the agreeable acid of the fruit deserves. It bears very abundantly.

P. Bleo, DC.

A red-flowering variety, in some gardens; originally from Mexico.

LII.—Ficoideæ.

Mesembrianthemum, Linn.

Of a large number of species for which the writer was indebted to Professor Sargent, of Cambridge, Mass., in 1874, the following were living and thriving in 1877:

M. acinaciformum, DC.
candens, Haw.
depressum, Haw.
edule, Linn.
M. heteropetalum, Haw.
multiflorum, Haw.
uncatum, Salm.
vaginatum, Lam.

The following were living, but appeared too tender for the climate

M. canlescens, Mill.
emarginatum, Linn.
murioatum, Haw.
violaceum, D. C.

M. rhomboideum, Salm.
subincanum, Haw.
tennifolium, Linn.
uncinatum, Linn.

There is thus good reason to suppose that this ornamental class of succulent plants at present hardly known in Bermuda might be easily naturalized.

LIII.—UMBELLIFERÆ.

Hydrocotyle umbellata, Linn. Pennywort.
In Devonshire marsh; American and West Indian species.

H. asiatica, Linn. Thick-leaved pennywort.

H. repanda, Pers.
The name is from *hudor*, water; *cotilé*, a vessel, Gr., from the cup-shape of the leaf.

Smyrnium olusatrum, Linn. Alexanders.
Naturalized at St. George's. From *smyrna*, myrrh, Gr.

Pastinaca sativa, Linn. Parsnip.
Cultivated since the seventeenth century.

Daucus Carota, Linn. Carrot.
Cultivated.

Angelica Archangelica, Cham. and Schl. Angelica.
Cultivated.

Coriandrum sativum Linn. Coriandum.
Probably introduced by Portuguese immigrants from Madeira. It is quite naturalized in some fields at Point Shares, and became a weed, which may be known by its offensive smell. From *thoris*, a bug, Gr.

Anthriscus vulgaris. Rough chervil; iron weed.
A common weed. The name is used by Pliny.

Chærophyllum sativum, Lam. Garden chervil.
Found in gardens.

Anethum graveolens, Linn. May-weed.
Naturalized and common, especially on St. George's Island.

Torilis nodosa, Gærtn. Cancalis.
A weed, introduced from Europe.

Pimpinella laterifolia, Link. Burnet saxifrage.

A weed.

Ferula communis, Linn. (*Fœniculum vulgare*, Gærtn.) Fennel.

In gardens; "sweet fennel"; probably the *Fœniculum dulce* of botanists; is mentioned among seeds sent out in 1616.

F. glauca.

An ornamental species. Introduced from Cambridge Botanical Gardens, 1874.

Apium leptophyllum, F. M. Fool's parsley.

Naturalized, and found commonly in waste places.

Apium graveolens, Linn. Celery.

Cultivated at Mount Langton, and of excellent quality. The temperature of the soil at 12 inches' depth ranged from 58° to 70° during the season of its growth.

Petroselinum sativum, Hoffm. Parsley.

Cultivated, and occasionally exported to New York. (*Apium Petroselinum*, Linn.)

LIV.—ARALIACEÆ.

Hedera helix, Linn. Common ivy.

Hardly naturalized, and grown with some difficulty, but not uncommon, and prized for decorative purposes.

Aralia guilfoylia, Hort.

Received from Cambridge, Mass., 1874, and living 1877.

LV.—CORNACEÆ.

Cornus stricta? Lam. Stiff cornel or Dogwood.

A plant received from the United States appeared to thrive in a shrubbery at Mount Langton.

LVI.—CAPRIFOLIACEÆ.

Caprifolium Italicum, R. S. Honeysuckle, cultivated.

C. sempervirens, Michx. Trumpet honeysuckle.

In gardens, but not luxuriant.

Lonicera xylosteum, Linn. Fly honeysuckle.

Given by J. M. Jones.

Viburnum Tinus, Linn. Laurestinus.

There is an abundance of this plant at Mount Langton, where it was probably introduced at no distant date, and it grows in very poor soil, but it is scarcely met with elsewhere. There is no tradition as to its introduction. It is in flower in nearly every month.

Sambucus nigra, Linn. Common elder.

A few plants are met with on the islands; for example, on a cross road in Hamilton Parish.

Benthamia fragifera, Lindl.

At Mount Langton, where it did not appear to flourish, and did not flower. Originally from the East Indies.

LVII.—RUBIACEÆ.

Gardenia florida, Linn. Cape jasmine.

In a few gardens.

G. Fortunii.

Introduced at Mount Langton, 1875, and likely to establish itself.

G. nitida, Hook.

The same remark.

Randia aculeata, Linn. Box briar.

An interesting example of local naturalization. This plant, from the West Indies, overspreads the hills in the parish of Warwick and part of Paget, and is unknown in the eastern parishes. Flowers in September. (*R. latifolia* in Lane's list.)

Hoffmannia splendens, Benth., or *Higginsia splendens*, Hort.

Originally from Mexico? Introduced at Mount Langton, from Barbadoes, 1875, and readily established itself where screened from high wind.

Rondeletia odorata, Jacq.

Introduced from the Botanical Gardens, Trinidad, 1872, and established at Mount Langton. Flowers in July.

Chiococca racemosa, Jacq. Snowberry; Blolly.

Native, and common in the Walsingham tracts. Extremely fragrant and ornamental both in flower and fruit; deserves cultivation. It is a native of the West Indies, and flowers October to December.

Ixora coccinea, Linn.

Is frequently met with in gardens.

I. Javanica, DC. *I. amboyine*, DC. *I. acuminata*, Roxb.

All originally from the East Indies. Were introduced at Mount Langton in 1874.

Coffea Arabica, Linn. Coffee.

Quite naturalized, but confined to shady, moist recesses among the caves at Walsingham. It is not mentioned by any early writers. The berries give a coffee of good quality, but, except for curiosity, no use is made of them, and the quantity is very inconsiderable. Flowers in May and June.

Psychotria undata, Jacq.

Native; a shrub found in the Walsingham tract, where its bright, glossy, dark, wavy, green leaves, tapering at the base, attract attention; flowers (inconspicuous) in April and May.

Morinda Royoc, Linn.

Native; a West Indian plant, found in the Walsingham tract.

Spermacoce tenuior, Linn. Button-weed.

Native; a West Indian plant, found in the Walsingham tract; found also in Florida. From *sperma*, a seed; *aké*, a point, Gr. The seeds have two points.

Borreria lævis, Gr

Native; found also in Florida.

Galium rubrum, Endl.

Larger and less common species than the next; flowered June 15, 1873.

G. uniflorum, Michx. Bedstraw; "Heal-soon."

A very common weed; flowers in June and July.

Vaillantia hispida, Linn.

V. muralis, Linn. (*Rhachicallis rupestris*, DC.)
Native, along the sea-shores.

LVIII.—VALERIANEÆ.

Centranthus macrosiphon, Bots.

A weed from Europe, in Dr. Rein's list. Name from *kentron*, a spur; *anthos*, flower, Gr.

Fedia olitoria, Vahl. Lamb Lettuce.

An annual weed; found on David's Island.

LIX.—COMPOSITÆ.

Ageratum conyzoides, Linn.
A weed.

Ageratum Mexicanum, Sweet.
A weed.

Eupatorium fœniculaceum, Willd. (*Artemisia tenuifolia*, Adans.)
A weed, of American origin.

Eupatorium conyzoides, Vahl.

Kleinia repens, Haw.

Bidens leucanthus, Willd.
A common weed; named from two teeth on the seed.

Cynara carduncculus, Linn. Cardoon. Artichoke.
Cultivated in gardens. The real artichoke, *C. scolymus*, Linn., the writer did not meet with.

Cichorium Intybus, Linn. Succory or chicory.

A weed from Europe, generally diffused, but not put to any use as in Europe.

Taraxacum Dens-leonis, Desf. (*Leontodon.*) Dandelion.
A common weed; named from the cut leaves.

Lactuca sativa, Linn. Lettuce.
Cultivated in gardens.

Sonchus oleraceus, Linn. Sow thistle.
A weed.
S. asper, Vill.

Crepis lyrata, Froel. (*Youngia lyrata*, Cass.)
A small weed.

Eclipta erecta, Linn.

A tall-growing, many-branched weed, with smooth stem and tumid joints, serrate leaves; abundant by water-courses in Pembroke Marsh. (*E. alba*, Hassk.)

Borrichia arborescens, DC. Samphire; Sea ox-eye.
Native; common to the West Indies and Florida. A yellow-flowering,

maritime shrub, with fleshy leaves, some glossy and of a bright green, some hoary and gray. They do not mark different varieties, being often ound on the same plant. Flowers in April and May. (*B. frutescens*, in Lane's list.)

Baccharis hetorophylla, H. B. Dogbush.

Native; abundant in Pembroke Marsh, where it flowers a little before Christmas. The ♀ flowers are a few days later than the ♂. (*B. halimifolia* in Lane's list.) A name given by the Greeks to an aromatic plant dedicated to Bacchus.

Solidago virgata, Michx. Golden-rod.

A coarse weed, very common, flowering in autumn. An American species.

S. sempervirens, Linn.

S. Mexicana, H. B.

These species, in the Southern States, affect swamps and salt marshes, but in Bermuda are met with on high ground; for example, on the battery hill, Mount Langton. Name from *solidare*, to unite, Lat., from supposed healing properties.

Erigeron Canadensis, Linn. Fleabane.

Common to the American States and the West Indies.

E. linifolius, Willd. (*Conyza ambigua*, DC.)

E. Philadelphicus, Linn.

E. quercifolis, Lam.

E. bonariensis, Linn. (*Conyza albida*, Willd.)

E., sp. not identified.

Stenactis anneca, Cass. (*Erigeron annuum*, Linn.)

Aster trifolium, Linn.

Artemisia tenuifolia, Willd. Wild wormwood; Cape weed; Godet's weed; French fennel.

A weed in cultivated ground. Brought to Bermuda from Cape François, in San Domingo, in packages of gin flasks, about the end of the last century, by M. Theodore Godet, who resided on Godet's Island, near Salt Kettle. (J. H. D.) Now common.

Senecio vulgaris, Linn. Groundsel.
A weed.

S. mikanoides, Otto. Italian ivy of gardeners.
A climbing species quite naturalized in some gardens.

Dahlia superflua, Ait.
Dahlias of poor quality are occasionally found in gardens. Originally from Mexico.

Zinnia elegans, Jacq.
Cultivated in gardens.

Pyrethrum Parthenium. Common feverfew.
Same remark.

Cineraria maritima, Linn. Sea ragwort.
Cultivated in gardens.

Helianthus tuberosus, Linn. Jerusalem artichoke.
This plant is said to be cultivated in gardens, but is not common; tried in Pembroke Marsh; it grew with great luxuriance, but the tubers were hardly larger than marbles.

H. annuus, Linn. Sun-flower.
Is grown in some gardens.

Centaurea gymnocarpa, Maris and Not.
A weed.

Gazania spendens, H. K.
Cultivated in gardens.

Pluchea odorata, Cass.
Native; found also in Pembroke Marsh, but not very abundant. Grows to a tall bush.

P. purpurascens, DC.
An annual; found in Shelly Bay Swamp and by Warwick Pond. Flowers in June and September. Both are West Indian; the latter is also found in Florida.

Polymnia Uvedalia, Linn.

A coarse yellow-flowering weed; not common; found at Mrs. Ewing's.

Parthenium Hysterophorus, Linn.

A very common annual weed by roadsides.

Ambrosia artemisiæfolia, Linn.

A. heterophylla, Muhl.

Weeds in cultivated ground or by roadsides.

Xanthium echinatum, Murr. Cocklebur.

A weed in cultivated ground; common to every part of the United States.

LX.—Goodeniaceæ.

Scævola Plumieri, Linn.

Native; common along the south shores; easily known by its white flower, apparently split on one side. Common also in the West Indies and the Southern States.

LXI.—Lobeliaceæ.

Lobelia cardinalis, Linn.

A garden flower.

LXII.—Ericaceæ.

Azalea viscosa? Linn., Ph.

Plants imported from Halifax, N. S., flowered very well at Mount Langton for several successive years, but were kept in a conservatory.

Rhododendron sp. Linn.

The same remark applies to the scarlet rhododendron, which, however, did not flower so freely as the azalea.

LXIII.—Plumbagineæ.

Statice Caroliniana, Wallt. Sea lavender.

Found by the margin of pools in the Walsingham tract, throwing up tall spikes of small blue flowers in September..

Plumbago Capensis, Thunb. Plumbago.

Not uncommon in gardens. It was introduced from Kew about 1832.

P. coccinea, Boiss., and *P. rosea*, Linn.

Were introduced at Mount Langton, and living, but not established, in 1877.

LXIV.—PRIMULACEÆ.

Anagallis arvensis, Linn. Red pimpernel.
A weed in cultivated ground.

Primula Sinensis, Hochst.
A garden flower.

LXV.—MYRSINEÆ.

Ardisia acuminata, Willd.

A. humilis, Vahl.
Introduced from the West Indies in 1873 and established at Mount Langton.

LXVI.—SAPOTEÆ.

Chrysophyllum Cainito, Linn. Star apple.
From the West Indies; in a few gardens.

Sapota Achras, Mill. Sapodilla.
From the West Indies; rather more common than the last; flowers about May; fruit July and August.

LXVII.—EBENACEÆ.

Diospyros Virginiana, Linn. Persimmon.
Introduced at Somerville some years ago and quite established. It grew also readily at Mount Langton, and becomes a nuisance by sending up suckers from the roots.

D. mabola, Roxb.
Was imported from the West Indies, but did not thrive.

LXVIII.—JASMINEÆ.

Jasminum gracile, Andr. Wild jasmine.
A remarkable example of rapid naturalization. This pretty climber was introduced at Paynter's Vale by Archdeacon Spenser, about 1840. It has now completely overrun the Walsingham tract to such a degree as to make the rocks in many places nearly impassable; flowers in June.

J. officinale, Linn., W. Common white climbing jasmine with pinnate leaves.

J. Sambac, Ait., W. White jasmine with cordate leaves.

J. fruticans, Linn. Common yellow jasmine.
All naturalized; the last flowers nearly all the year round.

LXIX.—Oleaceæ.

Olea Europæa, Linn. Olive.

"We haue oliues grow with us, but no great store." Such is the evidence of nearly the first writer on Bermuda, in 1612. It appears sufficient to prove that the tree was then naturalized, probably from seeds sown by the crews of Spanish vessels visiting the islands or wrecked on them in the sixteenth century. It is mentioned by Smith, 1624, and in 1661 the Bermuda Company ordered them to be planted on every shore; some of those trees are still standing. The fruit is very scanty and not put to any use.

Forestiera porulosa, Poir.

A bushy tree found in the Walsingham tract; there are specimens south of the road leading to the Causeway. It flowers in December, and the fruit may be found in March. Flowers, which are minute, are polygamous, in short, axillary, amentaceous racemes.

Ligustrum vulgare, Linn. Privet.

From an old stock found among the roots of a *Ficus elastica* at Mount Langton. A great number of plants were raised by cuttings and set out in fences as a rival to the oleander, but the plant did not come to any value. Flowers in February.

LXX.—Apocyneæ.

Allamanda Schottii, Pohl.

Only grown under glass at Mount Langton in 1876, but appears quite suited to bear the open air in sheltered situations.

Thevetia neriifolia, Juss. French trumpet flower. (*Cebera thevetia*, Linn.)

Naturalized, and not uncommon.

Vinca rosea, Linn. Red periwinkle.

Naturalized from West Indies. Common in gardens. *V. rosea*, var *alba* is met with less frequently.

Plumieria rubra, Linn. Frangipani.

Trees of large size are found in many old gardens, and are very ornamental. They lose their leaves in winter, and flower before the new leaf in May. Originally from tropical America.

Nerium Oleander, Linn.. Oleander; formerly called South Sea rose.

This beautiful plant, which from May to September is the greatest ornament of Bermuda, is said to have been introduced from Charleston, S. C., by a Mr. Lightbourn, of Paget Parish, about 1790. In the early years of the present century it was regarded as a rare exotic; now universally used for fencing purposes and as a screen from the sea winds.

Beaumontia grandiflora, Wall.

Sent from Barbadoes by General Munro, in 1874, and flowered freely in a conservatory in 1878.

Stephanotis floribunda, Pet., Thon.

Grows and flowers freely in good soil, but is not often met with. The secret of the best flowering plant at Mount Hill was *a neighboring pig-stye.*

LXXI.—ASCLEPIADEÆ.

Asclepias Curassavica, Linn. Wild ipecacuanha; in West Indies Red head or Blood flower.

Naturalized and common.

A. nivea, Linn.

Appeared spontaneously from some West India soil at Mount Langton and established itself.

Hoya carnosa, Br. Wax plant.

Found in gardens; originally from tropical Asia.

Stapelia maculosa. Carrion flower.

Originally from the Cape; not uncommon as a pot plant.

LXXII.—GENTIANEÆ.

Erythræa Centaurium, Pers.

A native of Britain. In Lane's list as a plant introduced.

LXXIII.—HYDROLEACEÆ.

Nama Jamaicensis, Linn.

Native; an annual weed with white or blue flower; by roadsides, but not common.

Nemophila insignis, Benth. Nemophila.

A garden flower from California; it was not found to do very well at Mount Langton.

LXXIV.—POLEMONIACEÆ.

Cobæa scandens, Cav.

This beautiful climber grew and flowered luxuriantly at Mount Langton, but never matured the seed.

Strobilanthes longicaudatus.

Received from Kew, and flowered well in a sheltered place.

Dipteracanthus affinis, Nees.

This beautiful climber flowered well against a wall. Received from Barbadoes, 1873.

LXXV.—CONVOLVULACEÆ.

Quamoclit coccinea, Mœnch. Cypress vine.

Introduced from America; quite naturalized, although confined to gardens, where it is self-sown in great quantity. Flowers in autumn.

Q. vulgaris, Chois.

Less common and less prolific than the other.

Batatas edulis, Chois. Sweet potato.

Of very early introduction; but it is not always easy to distinguish whether the sweet potato or the common potato is meant in early narratives. It is certainly mentioned in 1653. Sweet potatoes are largely grown.

Ipomœa tuberosa, Linn.

Yellow-flowering *Ipomœa* in the Public Garden of St. George's; removed from Mr. Swainson's, where it grew with great luxuriance, running over several small loquat trees.

I. Nil, Roth. (*Pharbitis Nil*, Chois.)

The common morning glory.

I. Learii, Paxt.

Naturalized in gardens.

I. Pes-Capræ, Sweet. Seaside vine.

Native; common on the sea shores.

I. villosa, R. P.

Found in cultivated ground, probably of chance introduction.

I. Jamaicensis, Don.

I. purpurea, Lam.

Native; the ornament of the well-known "Convolvulus Cave." (*Convolvulus*, Linn.)

I. dissecta, Pursh. Noyau vine.

Introduced; common. (*Convolvulus*, Linn.)

I. sagittifolia, Pursh. (*Convolvulus sagittifolius*, Michx.)

Naturalized from America, but only found in a small marsh near Shelly Bay, where it is very abundant.

I. sidifolia Schrad.

Naturalized from the West Indies at Clarence Hill, where it runs from tree to tree.

Dichondra repens, Forst.

A common creeping weed among grass.

D. Carolinensis, Michx.

A variety of the same.

LXXVI.—BORAGINEÆ.

Cordia Sebestana, Linn. Scarlet cordia.

Introduced from the West Indies; in a few gardens.

Tournefortia gnaphalodes, R. Br. Sea lavender.

Native, and common on the south shores; easily recognized by its thick heads of elongated hoary leaflets, and the scars on the branches, where preceding ones have fallen off; flowers white.

T. laurifolia, Vent.

At Mount Langton.

Heliotropium Curassavicum, Linn. Sea turnsole.

Native; found in salt marshes; may be recognized by the twin spikes of small flowers being gracefully curved over in opposite directions. The name is from *helios*, the sun; *trepo*, I turn, Gr.; the flowers being said always to turn to the sun.

Heliotropium Peruvianum, Linn. "Cherry-pie."

This fragrant and favorite plant is by no means common, and would appear not at home in Bermuda. The luxuriant growth seen in Madeira is never met with there.

Borago officinalis, Linn. Borage.

Lithospermum distichum, Orteg. Gromwell.

A seaside plant; native.

LXXVII.—SOLANEÆ.

Brunfelsia Americana, Linn.

A shrub found in flower in Mr. R. Outerbridge's garden, St. George's, October, 1876. The plant was devoured by white coccus.

Datura suaveolens, Humb., Bonpl. Moon plant.

A common ornament of gardens: both single and double flowering. (*Brugmansia suaveolens*.)

D. Tatula, Linn.

Native: met with as a weed in cultivated ground in Paget Parish; flowers pale violet.

D. Stramonium, Linn. Prickle-bur.

Native and common. It is alluded to in a proclamation of 1679 as "a badd and stinking weede that beares a prickle-burr, the which when it is drie it is full of flatt black seeds, which if suffered to grow, may be very destructive to the inhabitants of these islands, by reason of the venemous and poysonfull nature thereof."

D. Metel, Linn.

D. fastuosa, Linn.

From Mr. J. M. Jones; unknown to me.

Nicotiana Tabacum, Linn. Tobacco.

The principal export of Bermuda in the seventeenth century. The legislature again in 1878 gave encouragement to the cultivation of it. The plant springs up spontaneously among the ruins of old outhouses constantly from seed left perhaps a century or two before. The current value was 2*s*. 6*d*. a lb. in 1620, which had fallen to 3*d*. in 1690, when it ceased to pass as currency. There is reason to believe that the Bermuda tobacco was never of good quality, and that nothing but disappointment can attend its re-introduction.

N. glauca, Graham.

A native of South America; pretty common in gardens. Easily recognized by its yellowish tubular flower, resembling that of the tobacco plant, and blue green leaves.

Physalis edulis, Linn. Cape gooseberry.

Introduced from Cape Seed, 1874. It bears fruit abundantly and nearly all the year round, and will probably soon be found in every garden. (*P. Peruviana*, Linn.)

Physalis angulata, Linn. Cow cherry; Balloon berry.

Naturalized from United States; annual; a weed in cultivated ground.

P. pubescens, Linn. Horse cherry.

Naturalized annual, distinguishable from the above by the more oval form and bluish tint of the fruit; flowers in clusters. (*Physalis hirsuta*, Dun.)

P. lanceolata, Michx. In Lane's list.

Naturalized perennial.

Capsicum annuum, Linn. Guinea pepper; Chillies.

C. frutescens, Linn. Spanish pepper.

Both commonly grown in gardens.

S. torvum, Sw., *id.*

A weed.

S. aculeatissimum, Jacq. Cockroach berry.

Encouraged in waste places, notwithstanding its reputed very poisonous qualities, for its beautiful scarlet fruit.

S. nigrum, Linn. Nightshade.

A weed.

S. nodiflorum, Jacq.

S. tuberosum, Linn. Irish potato.

"Certain potato roots sent from England" are mentioned in the year 1613; "abundance of white, red, and yellow colored potatoes" are mentioned by Smith in 1623. There seems no doubt, therefore, that this plant, introduced into England from Peru in 1597, found its way to the Somers Islands at a very early date, although it is not always easy to distinguish it in the narratives from *Batatas edulis*, the Spanish or sweet potato. It is now a principal article of commerce. The exports in 1876 reached 2,260 tons (33,099 barrels).

S. ovigerum, Dun. Egg-plant.

Cultivated in gardens.

S. Lycopersicum, Linn. *Lycopersicum esculentum*, Mill., *id.* Tomato.

This plant has become a staple of cultivation in Bermuda since the emancipation of the slaves. The exports reached 672 tons in 1871, but fluctuate much with the seasons.

Lycium vulgare, Dun.

Found on David's Island; originally from Europe.

Petunia acuminata, Graham. White petunia.

Varieties single and double are cultivated. *P. acuminata*, Graham (white), and *P. phœnicea*, Juss. (violet), are common.

Nicandra physaloides, Gærtn.

A blue-flowering plant found by Lane near the commissioner's house, Ireland Island. Native of Peru.

Cestrum Parqui, Linn.

Introduced from Cambridge, Mass., 1874, and quite established at Mount Langton, where it flowered profusely.

LXXVIII.—SCROPHULARINEÆ.

Maurandia Barclayana, Bot., Reg.

M. semperflorens, Jacq.

Naturalized, and found clothing a great extent of moist walls at Mount Langton.

Lophospermum erubescens, Don.

An ornamental creeper, common in gardens; a native of Mexico.

Veronica agrestis, Linn. Speedwell.

V. arvensis, Linn.

V. peregrina, Linn.

Weeds; probably of American origin, but also European.

Buddleia Neemda, Roxb. Snuff plant.

Naturalized, and forming hedges in some places. From a proper name.

Capraria biflora, Linn. Tea.

This plant is found near the military police station and along the road to Prospect. Probably of late introduction from the West Indies.

Herpestis Monniera, HBK.

Found in wet ground about the race-course near Shelly Bay.

Linaria Elatine, Desf. Toad-flax.

L. vulgaris, Mill.

Russelia juncea, Zuccar. Heath.

An exotic from Mexico; quite naturalized and common in gardens.

Verbascum Thapsus, Linn. Mullein. Dock leaves.

A conspicuous weed, naturalized from Britain. The woolly leaves are used in Bermuda for cleaning purposes. It is mentioned by A. Michaux, 1803.

LXXIX.—GESNERIACEÆ.

Achimenes sp.?

In gardens.

Gloxinia sp.?

In gardens.

LXXX.—BIGNONIACEÆ.

Crescentia Cujete, Linn. Calabash tree.

Of early introduction; few young trees are to be found, but old ones are pretty numerous. The shells of the fruit are used for vessels. At Walsingham is the celebrated "calabash tree" referred to in one of Thomas Moore's poems.

Tecoma pentaphylla, DC. White cedar.

There are two varieties, one with entire leaves, the other with 3.5 leaflets on the same stalk, the flowers being undistinguishable, being exceedingly ornamental; the tree is often met with.

T. Stans, Juss. Trumpet flower.

A standard tree, with leaves impari-pinnate; leaflets 5-7, bearing abundant bright yellow flowers with narrow purple stripes.

T. radicans, Juss. Red trumpet flower.

Climbing red tecoma; common on houses.

T. Capensis? G. Don.

Orange-flowering climber at Mount Langton.

Bignonia capreolata, Linn.

Introduced at Mount Langton from Cambridge, Mass., 1874.

LXXXI.—ACANTHACEÆ.

Graptophyllum versicolor, Hort. Caricature plant.

Common in gardens.

Justicia alba, Roxb. Large white justicia.

At Bishop's Lodge and elsewhere.

Justicia lucida, Andr.
Common in gardens; almost a weed.

J. Ecbolium ? Linn. Blue justicia.
In gardens; not common.

Cyrtanthera rosea, *id.* Hort.
In gardens at St. George's and at Mount. Langton, where it was brought from Ireland in 1874.

Eranthemum Andersonii, Andr.

E. pulchellum.
From Trinidad, 1875; they were planted out, and appeared to bear the open air.

Thunbergia, sp. White thunbergia.
White and yellow; common in gardens.

Fittonia aryroncara, Coem.

Imported 1874. The heat and moisture of Bermuda appeared very suitable to this plant, but it was only grown in a conservatory.

LXXXII.—VERBENACEÆ.

Verbena multifida, R. P. White verbena.
Other ordinary garden species are cultivated. The white is the most common.

Stachytarpheta Jamaicensis, Vahl. Vervain.
Native or naturalized; a common weed, and reputed to possess great medicinal properties, especially in the treatment of yellow fever, now very rarely known in Bermuda.

Phryma leptostachya, Linn.
A weed of American origin.

Lippia nodiflora, Rich.

L. micromera, Schauer.

L. reptans, HBK. Godet's weed.

Aloysia citriodora, Orteg. Sweet verbena.
The sweet verbena is found difficult to propagate, and is by no means common in Bermuda, although plants of considerable size are met with.

Lantana Camara, Linn. Red sage.

Naturalized and abundant. It was introduced from Madeira about 1819, and formerly called Madeira sage = *L. aculeata*, Linn.

L. crocea, Jacq. Prickly sage.

Less common; flowers more yellow. It was brought from Madeira in 1818.

L. odorata, Linn. Common sage.

Introduced from the Bahamas by Colonel Spoffoth toward the end of the last century, with the idea that it would be good for firing, which it is not. It is now the pest of Bermuda, overrunning woods and pastures, and permitted by the supineness of the inhabitants to render thousands of acres of land valueless.

Citharexylon quadrangulare, Linn. Fiddlewood.

Naturalized and common, although said to have been first introduced by Archdeacon Spenser at Paynter's Vale, about the year 1830.

Duranta Plumieri, Linn. Pigeon berry.

Naturalized and common. The native species is unarmed. Some plants imported from Maderia in 1873 proved to be spiny, and the flowers somewhat larger and of a deeper blue than the common species.

Callicarpa ferruginea? Sw. Turkey berry.

One of the most ornamental of native plants, from its large masses of magenta-colored fruit. Found chiefly in the Walsingham tract; flowers in June.

Volkameria aculeata, Linn. Prickly myrtle. (*Clerodendron aculeatum*, Gr.)

Naturalized at Spanish Point and on Ireland Island, but not very often met with.

Clerodendron capitatum.

Wild around Pembroke workhouse, formerly the rectory; probably introduced.

Avicennia nitida, Linn. Black mangrove.

Native; usually accompanies the mangrove proper; there is a grove of trees on comparatively dry soil at Shelly Bay. The popular name, black mangrove, is derived from the color of the wood. (*A. tomentosa*, Linn., in Lane's list.)

LXXXIII.—LABIATÆ.

Ocimum Basilicum, Linn. Basil.
Introduced in 1616, and still cultivated.

Coleus, sp.
Common in gardens. The name comes from *koleus*, a sheath, Gr., from the union of the stamens.

Mentha viridis, Linn. Garden mint.

M. rotundifolia, Linn. Wild mint.
By roadsides.

M. arvensis, Linn. Marsh mint.
Common in Pembroke marsh.

Pycnanthemum muticum, Pers. Horse mint.

Calamintha Nepeta, Linn.

Melissa officinalis, Linn. Common balm.

M. Calamintha, Linn.

Nepeta Cataria, W. Catmint or Catnip.
Common in Pembroke marsh.

Salvia serotina Linn. *Monogynia.*

S. coccinea, Linn.
Naturalized, and common about Mount Langton and elsewhere. (Probably the *S. occidentalis* of Lane's list.)

S. splendens, Ker. Scarlet salvia.
Grows with great luxuriance in gardens; also a blue variety.

Sideritis Romana, Linn.
From Dr. Rein's list.

Scutellaria purpurascens, Swartz.

Lamium amplexicaule, Linn. Dead nettle.
Common by roadsides in Hamilton.

L. purpureum, Linn.
A weed; also common.

Marrubium vulgare, Linn. Horehound.

Leonurus sibericus, Linn.
Naturalized; occasionally springs up spontaneously.

Leonurus Cardiaca, Linn.

Lavandula spicata, Linn. Lavender.
In gardens.

Thymus vulgaris, Linn. Thyme.

Rosmarinus officinalis, Linn. Rosemary.

LXXXIV.—PLANTAGINEÆ.

Plantago lanceolata, Linn. Rib-grass.
P. major, Linn.

P. Virginica, Linn.
Roadside weeds.

LXXXV.—NYCTAGINEÆ.

Boerhavia erecta, Linn. Hogweed.
A weed found in cultivated ground at Paynter's Vale; minute apetalous flowers of pale pink. Probably introduced. Common to the West Indies and Southern States; flowers in September.

Mirabilis Jalapa, Linn. Marvel of Peru.

M. dichotoma, Linn. Four o'clock.
Both species are naturalized and almost wild; by roadsides.

Bougainvillea spectabilis, Willd.
Sent to Governor Lefroy, from Gibraltar, in 1874, by Colonel Laffan, R. E., afterward governor. This gorgeous plant has established itself in Bermuda with great rapidity, and is becoming one of its greatest ornaments. It flowers from November to May.

B. glabra.
At Clarence House; imported from the West Indies by Admiral Key.

LXXXVI.—PHYTOLACCEÆ.

Suriana maritima, Linn. Tassel plant.
Native and common along the south shores; flowers in May. Common all over the West Indies and tropics generally.

LXXXVII.—POLYGONEÆ.

Polygonum acre, HBK.

An aquatic weed abundant in ditches in Pembroke marsh. Common in West Indies and Southern States. From *polus*, many; *gonu*, knee; Gr., in allusion to the joints.

Coccoloba uvifera, Linn. South Sea or Seaside grape.

Common; probably native. It grows to a very large size, especially on the south shore behind Ardshields, in Paget Parish. (Girth of largest tree, 6 ft. 4 in.) The fruit is sometimes made into a preserve. Common in the West Indies. The name is from *kokkos*, fruit; *lobe*, a lobe; Gr., being three-lobed.

C. platyclada, Hook.

This plant is common in gardens, and grows to a considerable size, with a thick, woody stem. Originally from the Solomon Island. It flowers in December and January.

Rumex Acetosella, Linn. Common sorrel.

Met with in pastures.

R. obtusifolius, Linn. Dock, *loc.* Rhubarb.

This coarse weed is found in waste places.

Rheum Rhaponticum, Linn. Rhubarb.

Roots procured from the United States in 1872 were a failure, and soon died out.

Antigonon leptopus, Hook. & Arn. Coral plant.

A native of Mexico, much cultivated in the West Indies for ornament. Introduced at Mount Langton from Barbadoes.

LXXXVIII.—AMARANTACEÆ.

Amarantus spinosus, Linn.

A weed in cultivated ground; common in Southern United States. From *a* privative, Gr.; *marino*, I wither; allusion to the lasting character of the flower.

A. hybridus, Linn.

Also an American species.

Iresine Herbstii, Hook.

To be found in gardens.

LXXXIX.—CHENOPODIEÆ.

Chenopodium anthelminticum, Linn. Goosefoot family.

A coarse, strong-smelling, perennial weed; probably native; found among rocks and roadsides. Common in West Indies and United States. From ***kén***, Gr., a goose, and ***pous***, foot; in allusion to the form of the leaves.

C. ambrosioides, Linn.

An annual weed in cultivated ground; probably from West Indies. Native of Mexico.

C. album, Linn.

An annual weed in cultivated ground; from Southern United States (not West Indies).

Atriplex cristata, H. B. (*Obione cristata*, Moquin.) Sea orache.

An erect herbaceous plant common along the north shores, *e. g.*, near the ducking stool, where its spikes of minute male flowers are conspicuous in August and September. The female flowers, which are sessile in the axils of the branchlets, very minute, star-shaped, and of a grayish green color, appear rather later, in small groups of 2–4 flowers. The plant generally is scurfy, of grayish tint, 6″ up to 2′ high. From ***a*** privative, Gr., and ***trafein***, to nourish.

Salicornia fruticosa, Linn. Var. Marsh Sampphire; Glasswort.

Abundant in salt marshes; stem prostrate or creeping; branches succulent, leafless, cylindrical, erect, jointed, 6 in. to 1½ ft. high; flowers in May. *S. ambigua*, Michx., in Rein's list. *S. herbacea*, Linn., in Lane's list. From ***sal***, salt; ***cornu*** a horn, Lat.

Beta vulgaris, Linn. Beetroot.

In gardens, and cultivated, but to no great extent, for exportation to New York.

XC.—BASELLÆ.

Boussingaultia baselloides, HBK.

Grew luxuriantly over a veranda at Mount Langton, but was accidentally destroyed. I afterwards found it at a cottage on David's Island.

XCI.—LAURINEÆ.

Persea gratissima, Gaertn. Avocada or Alligator pear.

Common, and very fine. It is more prized by Bermudians than any other fruit. A tree at Mount Langton, planted about 1835, is now the finest in the island, and occasionally bears "peers" (*loc.*) of nearly 2 lbs. weight. It is much infested by white coccus. Flowers about March. The fruit is in season from August on to October, and sometimes later. *Persea Indica*, the venhatico of Madeira, was tried but failed. The name *Persea* is applied by Greek writers to another tree.

Laurus nobilis, Linn. Sweet bay tree.

Found in gardens and old plantations.

L. Carolinianum? Poir.

A tree of considerable size by the roadside west of Paget Church. Flowers in April.

XCII.—PROTEACEÆ.

Leucodendron argenteum, Br. Silver tree.

Many young plants were raised from seed received from the Cape of Good Hope, but none lived beyond a few months.

XCIII.—URTICACEÆ.

Pilea serpyllifolia, Wedd. Lace plant, or Artillery plant.

Common in gardens; introduced.

Bœhmeria cylindrica, Willd. False nettle.

Native, and abundant in Pembroke marsh; may be recognized by a general resemblance to a large nettle, especially in the flower found in Florida.

Urtica dioica, Linn. Common nettle.

U. urens, Linn. Small stinging nettle.

U. purpurascens, Nutt.

Distinguishable by the bold notches or saw-teeth on the leaves; all weeds; probably from Europe. The name is from *uro*, I burn, Lat.

Parietaria debilis var. *Floridana*, Nutt. Pellitory.

Found on the walls of the Public Garden, St. George's. From *paries*, Lat., a wall.

XCIV.—MORACEÆ.

Ficus Carica, Linn. Common fig.

The wild fig is nearly exterminated in Bermuda, although a few trees may still be found among the rocks, chiefly in the Walsingham tract. It is a small purple variety, with very deep-cleft 7-lobed leaves. Figs are not among the fruits mentioned by Jourdan or Strachey in 1610.

Rev. Lewis Hughes in 1615 rather refers to them as plants which may be introduced than as if they existed; on the other hand he speaks of "fences of figge and pomegranite trees" in 1621, and they are mentioned in a proclamation of very early date, probably 1616. In 1623 they were abundant enough to be dried for food. This abundance continued down to the present century. It seems probable that they were among the fruit trees introduced by the first settlers in 1612 or 1616, but they may have found the tree already naturalized from seed left by earlier visitors. There are several varieties of fig cultivated at St. George's, the only place where the fruit is tolerably abundant. It did not succeed at Mount Langton, where many trees of different varieties from the United States were planted about 1872.

F. elastica, Roxb. India-rubber tree.

Introduced from South America by the lady of Sir Hildebrand Turner, about 1826; now common. It grows to a very large size; a tree in Hamilton is 12 feet in girth.

F. aurata, Miq.

Introduced at Mount Langton 1875, and very healthy in 1877.

Morus rubra, Linn. Red mulberry.

There is a large tree, wild, among the rocks at Walsingham, and this is the species commonly found in gardens; whether *M. nigra*, the common mulberry, is to be found, is uncertain. The mulberry is mentioned in the earliest narratives, but the writers gave this name to the fruit of *Conocarpus erectus*. The Bermuda Company sent out mulberry seeds in 1616.

M. multicaulis, Perrot. Silkworm mulberry.

Introduced from America by Mr. Daniel Vaughan, about 1841, for feeding silkworms, and planted in many places.

M. macrophylla, Hort. Paper mulberry.

Artocarpus incisa, Linn. Bread fruit.

Introduced at Mount Langton 1874. One or two young trees appeared likely to thrive. Name from *artos*, bread; *karpos*, fruit, Gr.

A. integrifolia, Linn. Jack fruit.

To be found in the garden at Par-la-ville.

Maclura aurantiaca, Nutt. Osage orange.

Introduced by Captain Rollo, Forty-second Regiment, about 1851, by seed from the Mississippi; now naturalized, but uncommon.

M. Xanthoxylon Endl. Tamarind plum.

To be found in the gardens of Mr. H. Trimingham and Mr. Richardson, Paget Parish. Introduced from the West Indies about 1865. The fruit is ripe in September.

XCV.—CELTIDEÆ.

Celtis Missisippiensis? Bosc. Nettle tree. Cherry.

Native, but not common. There is a large tree near the Church Cave, and several about the parsonage, Southampton. Flowers in March. (*C. occidentalis*, Linn.?)

Sponia Lamarckiana, Decaisn. No local name discovered.

Native. This plant forms the underwood of a large part of the Walsingham tract, especially near Paynter's Vale, and grows to a straggling tree of considerable size, the largest 38 inches round. It is easily recognized by the roughness of the leaves and shoots. The flowers, which are apetalous, very minute, and obscure in the axils of the leaves, will be found in June. It occurs in the Bahamas and West Indies generally.

XCVI.—PLATANACEÆ.

Platanus occidentalis, Linn. American plane.

Grows well in Bermuda, and is occasionally found about houses. The name is from *platys*, ample, Gr., in allusion to the shade.

XCVII.—MYRICEÆ.

Myrica cerifera, Linn. (*M. punctata*, D. C.) Candleberry myrtle.

Is common in some parts of the island, especially in the grounds of Mount Langton and in Devonshire marsh; it has a habit of growing immediately under and among the roots of the cedar trees. It flowers in March. Probably introduced by natural causes. Name from *myriké*, Gr.; of no application to this species.

XCVIII.—CASUARINEÆ.

Casuarina equisetifolia, Forst.

Was abundant a few years ago on Ireland Island; now reduced to one or two trees in the grounds of the captain superintendent; generally taken for tamarisk. Probably introduced from the West Indies, but originally from the South Seas. Name from a slight supposed resemblance of the foliage to the plumage of the cassowary.

XCIX.—SALICINEÆ.

Salix Babylonica, Linn. Weeping willow.

Introduced by Lady Hildebrand Turner, about 1830, and now very common in low grounds.

S. Humboldtiana, Willd. Caraccas willow.

Evidently, from the local name, introduced from Caraccas, and now frequently seen. It grows very readily and rapidly in moist ground.

C.—EUPHORBIACEÆ.

Poinsettia pulcherrima, Gra.

Naturalized and common, growing with great facility from cuttings. Originally from Mexico. This gorgeous plant flowers in November, and for some weeks becomes one of the principal ornaments of Bermuda. Name from Poinsette, a Mexican traveler.

Phyllanthus Niruri, Linn.

An annual weed in gardens; easily known by the minute flowers along the under side of the branches; grows about 1′ high. Found in all tropical countries.

Jatropha podagrica, Hook. Gouty-stalked atropha.

Introduced by Mr. S. S. Ingham, 1875.

J. multifida, Linn. Coral plant.

Common in gardens; originally introduced from West Indies. From *iatron*, Gr., a remedy; *fago*, I eat.

J. Curcas, Linn. Physic nut.

Native; to be found in the Walsingham tract. Flowers in June. It is naturalized in all tropical countries.

J. panduræfolia, Andr., or *hastata*, Jacq.

This beautiful species, with deep rose flowers, may be found in Mr. Reid's garden, Hamilton. Flowers in April. A native of Cuba.

J. manihot, Linn. Cassava.

Cultivated as early as 1621, being mentioned by Rev. Lewis Hughes as ' likely to prove a great blessing of God." Probably then recently introduced from the West Indies. It is still very generally grown, custom having connected the making of "cassava pies" and "cakes" with Christmas festivities, but cassava bread does not enter materially into the diet of any class.

Aleurites triloba, Forst. Otaheite walnut.

Common, and naturalized. The local name would point to its having reached Bermuda from the East Indies, probably about the time of its introduction into the West Indies. From *aleiar*, Gr., flour, in allusion to its appearance.

Cicca disticha, Linn. Otaheite gooseberry.

Naturalized, but not common. There is a large tree at Mount Langton. Flowers in May and June; loses its leaves for a short time in winter. (*Phyllanthus longifolius* Jacq.)

Ricinus communis, Linn. Castor-oil plant. Palma Christi.

Common, and completely naturalized, if not native. It appears to be the plant mentioned by Smith as the redweed, in 1623, and was extensively cultivated as the "oyl seed" about 1632. No use is at present made of the fruit. Dr. Pusey's identification of this very quick growing plant with Jonah's gourd, if not quite satisfactory, is at least interesting.

Croton maritimum, Walt.

Native, and common along the south shore. This plant is American and not West Indian, extending from Florida along the Carolinas.

Croton, sp.

Several ornamental varieties were introduced at Mount Langton, 1872–'76, viz, *C. angustifolium*, Hart.; *C. discolor*, Rich.; *C. pictum*, Hort.; *C. tenæum*, Mullty.; *C. variegatum*, Forsk. (previously cultivated); *C. undulatum*, *C. cornatus*, Vell. These all appear to thrive in the open air, and will probably become common in gardens hereafter.

Acalypha tricolor, Hort.

Introduced from Barbadoes, 1874; grew well in the open air at Mount Langton; originally East Indian.

Hura crepitans, Linn. Sandbox tree.

There is an old tree in the Public Garden, St. Georges, and it is not uncommonly met with elsewhere. It grows very readily; loses its leaves in winter, recovering them in May; flowers in August.

Pedilanthus tithymaloides, Poit. Arsenic plant. Slipper plant.

Common in gardens, notwithstanding its reputed poisonous properties, its vivid green being pleasing to the eye; West Indian. From *pedilon*, Gr., a slipper; *anthos*, a flower.

Euphorbia buxifolia, Lam., or *glabrata*, Sw.

Common on the rocks along the sea-shores; may be known by the pointed oval leaves overlapping each other along the stem.

E. maculata, Linn.

An annual weed, growing in flat circular patches; of purplish tint.

E. prostrata, Ait.

An annual weed, differing little from *E. maculata*.

E. hypericifolia, Linn.

A tall, erect, annual weed, common in cultivated grounds.

E. heterophylla, Linn. Joseph's coat.

Annual or biennial; grows to a height of 3′. The red patch on some of the upper bracts makes it a conspicuous plant.

E. Peplus, Linn.

Annual weed, of universal diffusion; probably originally from Europe.

E. Jaquinæflora, Hook.

Introduced from Madeira, 1874, and grows freely.

The negro name *Tittimelly* is applied indiscriminately to all these Euphorbias.

E. Candelabrum, Trem.

A fine plant at Bishop's Lodge, from which many cuttings have been taken.

E. splendens, Bojer.

Found in many gardens.

Mercurialis annua, W. Mercury, or Mockery.

Introduced from Europe; a very common weed.

CI.—PIPERACEÆ.

Peperomia obtusifolia, Dietr.

Native, and abundant in the Walsingham tract, where its dark, glossy, succulent leaves and spikes of minute flowers are an ornament to the rocks wherever there is any shade or moisture. A native of the West Indies.

CII.—CERATOPHYLLEÆ.

Ceratophyllum demersum, Linn. Ditchweed.

Common in Pembroke marsh, and to northern temperate and tropical zones of all climates.

CIII.—ARISTOLOCHIACEÆ.

Aristolochia trilobata, Linn. Birthwort; Dutchman's pipe.

At Mount Langton and at the Naval Hospital, Ireland Island. Introduced from the West Indies. The name has reference to its supposed virtues in parturition.

CIV.—JUGLANDEÆ

Juglans nigra, Linn. Black walnut.

One or two specimens are extant at Par-la-ville. The name comes from *Jovis glans*, Lat., the nut of Jove.

CV.—CUPULIFERÆ.

Quercus alba? Linn.

There was a healthy young tree at or near Par-la-ville, Hamilton, in 1875.

The following species, received from the Botanical Gardens, Cambridge, Mass., were planted in the grounds of Mount Langton in 1872, but with little promise of permanency: *Quercus aquatica*, Walt.; *Q. Catesbæi*, Michx.; *Q. cinerea*, Michx.; *Q. nigra*, Linn. The plants lingered until 1877, but made no growth.

GYMNOSPERMÆ.

CVI.—CONIFERÆ.

Juniperus Bermudiana, Linn. Bermuda cedar. (*J. Barbadensis*, Linn.)

The characteristic native forest tree of the Bermudas, which still clothes a very large part of the entire area of the islands. It owes its universality and its success in the struggle for existence apparently to its power of withstanding the gales of wind for which the Bermudas have always been famous. This power again is due to the little resistance offered by the foliage, to the hardness and toughness of the wood, and to the remarkable power possessed by the roots of holding on to the rocks and penetrating their interstices. It can also extract nourishment from almost pure lime, such as coral sands newly thrown up. Cedar roots are said to exist *in situ* in places along the outer reefs. They have certainly been found at 3 to 5 fathoms depth in Elies Harbor and in Hamilton Harbor. Cedar wood in a condition approaching lignite was found at a depth of 47 feet below low-water mark in dredging for a bed for the Bermuda dock. The length of time necessary for a subsidence of 47 feet indicates a very long prevalence of the same conditions. The cedar formerly attained a very great size; planks of 32 inches width are mentioned in the records of the seventeenth century; there is still standing in Devonshire church-yard the shell of an old tree 59 inches in diameter, and a portion of a trunk 42 inches wide was found below the surface of Pebmroke Marsh in 1872. This tree must have been 6 or 7 feet in diameter. The largest trees now standing and to all external appearance sound are on Long Bird Island and at Daniel's Head; they are about 11 feet in circumference. Owing to the total neglect of forestry, no attempt ever being made to thin the abundant seedlings which spring up round every pistillate tree, the thickets are much too crowded, and a great proportion of the trees become stag-headed early. Really valuable cedar timber is becoming scarce as the better soils are more and more brought under cultivation, but there is still a great deal suitable for cabinet work, for which its beauty and fragrance recommend it; and birds'-eye pieces are in considerable demand. The cedar flowers in March, when the stamenate trees put on a golden appearance, which adds much to their beauty.

Thuja pyramidalis, Tenor.

There was a tree of some years' standing at Mr. Henry Darrell's, Hamilton, and several promising young plants at Mount Langton.

Araucaria Bidwellii, Hook. The Bunya Bunya of Queensland.

Two plants received from Trinidad in 1875 were well established at Mount Langton in 1877.

A single small *Pinus* at Mr. Shaw Wood's, Spanish Point, was the only other *Conifer* known to the writer until a number of species were received from Cambridge, Mass., and planted out in November, 1874. Of these the following were living in March, 1877, but the majority had made little growth:

Biota Nepaulensis, Endl.
orientalis, Don.
Cupressus funebris, Endl.
Lawsoniana, Murr.
macrocarpa, Hartw.
torulosa, Lamb.
Pinus longifolia, Lamb.
inops, Ait.
pinea, Linn.
Sabiniana, Dougl.
Sequoia gigantea, Torr.

Thuja gigantea, Nutt. Promising well.

T. plicata, Lam.

Torreya Californica, Torr.

Cryptomeria elegans, Veitch. Promising well.

The conclusion must be that few of the fir tribe will grow in Bermuda. The Bahamas species, *Pinus Bahamensis*, Griset., has, however, not been tried. A number of cones were procured, but they had all shed their seed.

CVII.—CYCADEÆ.

Cycas revoluta, Thunb. Sago palm.

This plant is to be found in nearly all old gardens, and was probably introduced from the West Indies, although a native of India. No use is made of the starch it produces.

ADDENDA.

The following orders have been accidentally omitted in their proper sequence:

TAMARISCINEÆ. (To follow order XLII.)

Tamarix Gallica, Linn. Spruce.

Introduced from Europe; now common along the shore roads; is often planted as a screen.

TETRAGONIACEÆ. (To follow order LII.)

Tetragonia expansa, Ait. New Zealand Spinach.

Cultivated as a vegetable for the table.

GENTIANEÆ. (To follow order LXXI.)

Erythræa Centaurium, Pers.

Introduced. (Lane.)

MONOCOTYLEDONS.

I.—CANNACEÆ.

Canna Indica, Linn. Indian shot.

Naturalized, and common in gardens.

C. coccinea, Ait.

Common in gardens.

C. lutea, Ait. Yellow canna.

C. edulis, Ker. Tous-les-mois.

Cultivated to a small extent for the market on St. George's and David's islands; formerly more extensively grown.

Maranta arundinacea, Linn. Arrowroot.

Introduced toward the end of the last century. The exports, which reached 90 tons in 1844, now rarely amount to one-fourth of that quantity simply because other crops are found less exhausting to the soil, and more remunerative. Bermuda arrowroot, however, is still unrivaled in quality. From 15 to 20 lbs. of the starch are made from 100 lbs. of the root.

II.—ZINZIBERACEÆ.

Zingiber officinale, Rosc. Ginger.

Was easily raised at Mount Langton from West Indian roots.

Alpinia nutans, Rosc. Shell plant; Ginger.

Naturalized and common in plantations. (*Renealucia occidentalis*, Gr.) Native of the West Indies and Central America.

Hedychium speciosum? Wall.

From Madeira. Flowered at Mount Langton; originally from the East Indies.

III.—MUSACEÆ.

Musa paradisiaca, Linn. Plantain.

Not much grown in Bermuda. "Plantanes" are mentioned as early as 1621, and were probably among the first vegetable importations from the West Indies.

M. sapientum, Linn. Banana.

There are four well-marked varieties of banana produced in Bermuda, where it in extensively cultivated.

(1.) The red banana (*M.* var. *rosaceæ*, Jacq.), which is scarce. Owing to the prevalence of high winds, it can only be grown in well-sheltered places, and is about twice as long as any other species in producing fruit.

(2.) The "old Bermuda banana," a tall-growing variety, of very fine quality; now rarely met with.

(3.) The "thumb banana," which is by far the best, although very small, from its subacid flavor and dryness of substance.

(4.) The "dwarf banana" (*M. Cavendishii*, Paxton,) which is the variety commonly cultivated, and occasionally produces bunches of 80 lbs.

weight. These bananas flower and ripen fruit all the year round; but there is considerable difference in the time it takes. A plant flowering in April, with the summer before it, will produce a bunch fit to cut in 90 or 100 days; a plant flowering in November, with the winter before it, will take 150 or 160 days.

It is almost the only fruit always procurable in Bermuda, but the growth is too much left to chance, little or no horticultural skill being applied to it.

Strelitzia Reginæ, Ait. Crane's bill.

To be found in many gardens.

IV.—BROMELIACEÆ.

Ananassa sativa, Mill. Pineapple.

The pineapple was extensively cultivated in Bermuda in the seventeenth century, and is frequently referred to the Records. Its complete disappearance concurs with other indications to suggest that the climate has undergone a change. The mean temperature of Bermuda is much below that of the Bahamas, where they are so largely grown. Several plants were set out in Mount Langton Garden in 1875, but came to nothing, very possibly, however, from not being fresh enough, from insufficient manuring, or for want of skill.

Billbergia farinosa, Hort., and *B. tinctoria*, Mart.

Sent from the Botanic Gardens, Cambridge, Mass., 1874. Failed to establish themselves.

V.—ORCHIDEÆ.

Spiranthes brevilabris, Lindl. (Q. *S. apiculata?*)

The only native orchid, now tolerably abundant in Devonshire and Pembroke marshes, where it flowers in May; the species is not fully ascertained. Dr. Rein calls it *S. tortilis*, but remarks that he only saw two specimens.

Several common West Indian orchids have been introduced from time to time, and occasionally flower, *e. g. Oncidium Papilio*, Lindl., at Cavendish; others at Clarence Hill. The vanilla plant, *Vanilla planifolia*, was imported from Trinidad in 1872, but made little growth, and had not flowered in 1877.

VI.—IRIDEÆ.

Iris violacea, Sweet. Iris.

I. Virginica, Linn.

Sisyrinchium Bermudiana, Linn., *loc.* Bermudiana.

Native, and universal; classed by Bentham also among native Brit ish plants; the flowers, which begin to appear in April, are as dear to the Bermudian as the primrose to the Englishman. (*S. anceps* in Lane's list; *S. alatum*, Hook.)

VII.—DIOSCOREÆ.

Dioscorea lutea, Mey. Yam.

The yam is grown in Bermuda, and usually produced at fruit and flower shows, but is rare and does not enter into the ordinary diet of any class of natives. (*D. sativa*, Linn.)

VIII.—NAIADEÆ.

Ruppia maritima, Linn. A marsh weed.

Zostera marina, Linn. Sea-wrack; Grass-weed.

Found in shallow sea-water, but not properly a sea-weed.

IX.—PALMÆ.

Sabal Palmetto, Lodd, or *Chamærops Palmetto*, Michx. Palmetto.

Native, and universal; originally American, not West Indian. The Palmetto furnished the first settlers with a sweet fruit of which they published exaggerated praises; with a vegetable obtained by cutting out the heart of the young leaves; with an intoxicating beverage they called *bibey;* and with covering for their cabins, and even their churches. Hence it is very frequently mentioned, and numerous laws were passed for its preservation. There are trees of 40 to 50 feet high. The leaves are still extensively used for making plat, which was formerly exported. We learn from Raynal that it was fashionable in Europe in the last century. Fans and many fancy articles are also made from them, but the present inhabitants are not sufficiently industrious to make them of commercial value. Flowers in June and July.

S. Adansoni, Guer. Small thatch, or Dwarf palmetto.

Also American, and seldom to be found. It was formerly common and still occurs near Paynter's Vale.

S. Carat and *S. Mucini* were planted at Mount Langton with promise of permanence.

Oreodoxa oleracea, Mart. Cabbage palm.

Introduced. Five conspicuous trees, called the sisters, near Hamilton, attract the attention of every visitor; there are many others.

Astrocaryum aureum, Gr. and Wendl. Gru-gru, or Gri-gri.

Introduced; not common. There are two fine specimens at Mount

Langton; flowers in June and July, with a strong odor, very disagreeable to many persons. Bermuda is probably the most northern locality of this palm.

Cocos nucifera, Linn. Cocoa nut.

Introduced. The trees are not numerous, and the fruit, although fully formed, is not brought to perfection. It does not occur on sandy beaches, and is not mentioned in any early accounts.

Phœnix dactylifera, Linn. Date palm.

Specimens are not uncommon, but many of them being isolated trees, either stamenate or pistillate, the fruit is rarely seen. It is, however, produced, and ripens in St. George's.

Rhapis flabelliformis, Linn.

This pretty little Japanese palm is common in gardens and very readily propagated.

In addition to the above the following were introduced at Mount Langton from the West Indies, and apparently established: *Thrinax Barbadensis*, Todd; *Thrinax elegans*, Hort, Lindl; *Areca Catechu*, Linn.; *Hyophorbe Vershafelii*, Wendl.; *Livistona Mauritiana*, probably *Chinensis*, Mart.; *L. rotundifolia*, Hort., Lindl.

The following were tried but came to nothing: *Caryota Cummingii*, Lodd.; *Martinezia caryotæfolia*, H. B.; *Phytelephas macrocarpa*, R. P.; *Pritchardia Pacifica*, Seem.

X.—PANDANEÆ.

Carludovica palmata, R. P.

Introduced at Mount Langton in 1872 from the West Indies, and established.

Pandanus utilis, Borg. Screw-pine.

At Mount Langton and elsewhere.

Pandanus odoratissimus, Linn.

Found in the garden of Mr. Saltus. A native of Mauritius.

Pandanus Veitchii, Lem.

Introduced from England, 1874, and established at Mount Langton.

XI.—AROIDEÆ.

Richardia Æthiopica, Kth. Guinea yam, or arum.

Common in gardens.

Dieffenbachia Seguine, Schott. Dumb cane.

Introduced at Mount Langton from the West Indies in 1874. It quite established itself.

Anthurium cordifolium, Kth.

The same remark.

Philodendron lacerum, Schott.

The same remark.

Colocasia esculenta, Schott. Eddoe.

Cultivated and eaten by the colored natives to a small extent.

Caladium. Bleeding heart.

Many ornamental varieties, such as *C. maculatum*, Todd; *C. bicolor*, Vent.; *C. chantini*, Linn.; *C. argyriteæ*, Lank, &c., were cultivated in the conservatory, Mount Langton, and plants are not uncommon in the island.

Lemna minor, Linn. Duck weed.

L. trisulca, Linn.

Amorphophallus. Snake plant.

The local name is suggested by the mottled appearance of the tall stem, like the skin of a snake. Individuals are occasionally brought up from the West Indies, but it is a plant of Indian origin.

XII.—TYPHACEÆ.

Typha angustifolia, Linn. Catstail.

Native of West Indies, and as *T. latifolia* var. of Florida.

XIII.—LILIACEÆ.

Asparagus officinalis, Linn. Asparagus.

The writer imported about 500 roots in 1872. They produced very slender shoots, and died out in a year or two.

A. Natalensis, Hort.

This pretty plant was received from Trinidad in 1875, and did well.

Allium Cepa, Linn. Onion.

One of the staple products of Bermuda, for which soil and climate seem alike adapted. They were planted by the first settlers in 1616, and at that time probably perpetuated by seed allowed to ripen for the purpose. At present the seed is imported annually, chiefly from Madeira. Cultivation of the plant on a large scale only dates from about 1845. Seeds of all the best varieties cultivated in Europe were sent from the Royal Gardens, Kew, in 1873, and widely distributed; 16 sorts were tried at Mount Langton. The writer could never ascertain that any of them commended themselves to the growers as superior to the sorts they were accustomed to sow.

Onions in Bermuda are sown in October and November, set out in November or December, and pulled for market in April and May. The export reached the large quantity (for the area of the islands) of 4,180 tons in 1875, which has not since been exceeded.

Aloe vulgaris, Lam.

Locally called, from its flower stalk, bamboo; very common; probably native.

A. soccotrina, Lam. Barbadoes or bitter aloe.

Naturalized and common.

Agave Americana, Linn. Golden aloe.

Not common, but found in many gardens in Paget and Warwick Parishes.

A. Mexicana, Lam. Blue aloe.

At Spanish Point; not common.

A. variegata, Hort.

Common in gardens.

A. striata, Zucc.

Introduced from Kew, 1872.

A. xylonacantha, Salm.

Introduced from Kew, 1872.

A. Jaquiniana, Sch.

Introduced from Cambridge, Mass., 1874.

Yucca serrulata, Haw. Spanish bayonet.

Very common; its tall white spikes of flowers are highly ornamental in May and June (*Y. aloifolia*, Linn., in Dr. Rein's list). *Y. filamentosa*, Linn., and *Y. Whipplei*, Torry, were among plants received from the Botanical Gardens, Cambridge, Mass., in 1874, which survived and were established at Mount Langton.

Gasterica obliqua, Haw., *G. maculata* Haw., and *Haworthia tortuosa*, Haw., were introduced at Mount Langton from England and are likely to become common in gardens.

Euclearis Amazonica, Lindl.
Imported from the West Indies, 1876, and flowered well.

Lilium candidum, Linn.
Tall white lily; very common in gardens.

L. Japonicum, Thunb.
White Japan lily; also common. Both are largely used as Easter decorations.

Ischarum Boveii ? Hook, (Blume, Rumph, i, 29), *loc.* Black lily.
Brought from the neighborhood of Hebron by Mr. and Mrs. T. S. Reid in 1876. The roots, two in number, have thrice flowered in Bermuda towards the end of March. The spadix is described as of a charcoal black, the interior of the spathe resembling a dark, rich, velvet toning to maroon. (R. Gaz.; 25 March, 1879.)

Narcissus Jonquilla, Linn. Jonquil.
Naturalized and common.

Hyacinthus orientalis. Hyacinth.
Was grown at Mount Langton, but not well.

Ornithogalum latifolium, Linn. Star of Bethlehem, *loc.* Squill.
Naturalized, and met with about old houses.

Cyrtanthus catalpæfolia, Nees.
From Cambridge, Mass., 1874. It flowers well.

Medeola Virginica, Linn.
A small annual weed found under walls. (*M. Carolinea* in Lane's list.)

Eucomis regia, Ait.
Received from Cambridge, Mass., 1874.

Hemerocallis fulva, Linn., W. Day lily.
In gardens.

Gladiolus, sp.
Many varieties are found in gardens. A considerable number of bulbs received direct from the Cape of Good Hope, in 1874, were planted with indifferent success; the flowers were poor; the plants died out.

Sanseviera Guineensis, Willd. Bowstring hemp.
Naturalized, and common in gardens.

Phormium tenax, Forst. New Zealand flax.
Introduced from Kew in 1875, and planted in Pembroke marsh, where, however, it did not flourish, although the plants were living in 1877. They were choked by native weeds.

Polianthes tuberosa, Linn. Tuberose.
To be met with in gardens. Originally a native of India.

Scilla sp.? Squill.
A species is naturalized, and springs up spontaneously about old houses.

Fourcroya gigantea, Vent. Aloe.
Naturalized and common.

Pancratium ovatum, Mill. Spider lily; Churchyard lily.
Naturalized, and common in gardens.

Crinum cruentum, Ker. Giant lily, or Essequibo lily.
Naturalized, and common in gardens.

Amaryllis equestris, Ait. Barbadoes lily.
Naturalized, and common about houses.

A. Sarniensis, Linn. Guernsey lily. (*Nerine sarniensis*, Herb.)

Nerine pulchella, Herb.

Leucoium æstivum Linn. Snowflake.
In the garden at Cavendish; flowers regularly.

Zephyranthes Atamasco, Herb.

Z. rosea, Lindl.
Grown at Mount Langton.

XIV.—SMILACEÆ.

Smilax sagittæfolia, Bot. Mag. Sarsaparilla.
Naturalized at Camden and abundant there, but not often found elsewhere.

Cordyline angustifolia, Hort.
From Cambridge, Mass., 1874; doing well 1877.

Dracæna terminalis, Linn. Purple dracæna.

D. australis, Forst. Green dracæna.
Common in gardens.

XV.—JUNCEÆ.

Juncus tenuis, Willd. Rush.
Common in moist places.

*J. **maritimus***, Lane. Large marsh rush.
Native; common in the wetter portions of the marshes.

XVI.—COMMELYNEÆ.

Tradescantia discolor, Herit. Spider-root. Oyster-plant.
Common in gardens.

Tinantia Sprucei, C. B. Clarke.
This plant appeared as a seedling in some partly West India soil at Mount Langton = *Tradescantia erecta*, Jacq.

Commelyna agraria, Kth. Day-flower. (*C. Cayennensis*, Rich.)
Native; and very general in wet places, to which its bright blue flower is an ornament; sometimes called "Chicken-grass."

Cyanotis discolor, L'Herit.
Common in gardens and window-boxes.

XVII.—CYPERACEÆ.

Cyperus rotundus, Linn. Nut-grass.
Native; according to Moseley there are 10 or 12 species.

*C. **flexuosus***, Vahl.
Native.

*C. **alternifolius***, Linn. Variegated cyperus.
Introduced; common in gardens. The name comes from Cypris, a title of Venus.

Kyllingia monocephala, Linn. Sedge.
In Pembroke marsh.

Scirpus validus, Vahl., (*S. lacustris id*). Club-rush.
Common in Pembroke marsh.

*S. **plantagineus***, Roxb., Sw.
In Pembroke marsh, (*Eleocharis*, R. Br.)
*S. **melanocarpus***, Gr.

Cladium occidentale, Schrald. Prickly sedge.
In Pembroke marsh.

Rhynchospora stellata, Gr. White sedge.

Native; abundant in Pembroke marsh.

R. pura, Griseb.

R. Florida, A. Dietr.

From *rhynchos*, a snout or beak; *spora*, a seed, Gr. They are all West Indian.

XVIII.—GRAMINEÆ.

Bambusa vulgaris, Wendl. Cane; Bamboo (which latter term is also applied to the flower stalks of the aloe).

An ornament of lawns and shrubberies, and used for fencing, but not grown to any extent.

Alopecurus pratensis, Linn. Fox-tailed grass.

Arundo Donax, Linn. Cow-cane.

Found in many gardens, and cut as fodder for cattle.

Arundinaria tecta, Muhl.

S. elongatus, R. Br.

S. Virginicus, Kunth.

S. purgans. Kth.

From Dr. Rein's list. Probably *S. pungens*, Kth.

S. Indicus, R. Br.

Polypogon monspeliensis, Desf.

Found among the rocks, North shore.

Leptochloa mucronata, Kunth.

From *leptos*, slender; *choé*-grass, Gr.

Eleusine Indica, Gaertn.

Chloris petræa, Sw.

Cynodon Dactylon, Pers. Devil grass.

In the United States, Bermuda or Scotch grass.

Paspalum distichum, Burm. (*P. littorale*), R. Br.

P. filiforme, Flügg. Wire grass.

P. setaceum, Mich.

Paspalum from the Greek name for millet.

Stenotaphrum Americanum, Schrk.

S. glabrum, Trin. Crab grass.
The general herbage of the country.

Digitaria setigera, Roth. Finger grass.

Sclerochloa rigida, Panzer. Hard grass.
Probably introduced from Europe.

Panicum molle, Swartz. Para grass.
Grown in marshy grounds as cattle food, especially at Camden.

P. maximum, Jacq. Guinea grass.

P. brevifolium, Kunth.

P. capillare, Linn.

P. lineare, Burm.

P. oplismenus.
Found in the cave near Smith's Parish church.

P. variegatum.
This ornamental Australian species was introduced at Mount Langton and lived for 3 years, but never appeared very flourishing.

P. virgatum, Linn.

Gynerium argenteum, Nees. Pampas grass.
Grown at Mount Langton and Clarence Hill.

Setaria glauca, Beauv.
From *seta*, a bristle.

Cenchrus echinatus, Linn.
Common on the Paget sand hills; not, as in Jamaica, used for cattle.

C. tribuloides, Linn.
Kenchros is the Greek name for millet.

Andropogon schœnanthus, Linn. Lemon grass.
From *anér*, man; *pogon*, beard, Gr.

Sorghum saccharatum, Mœnch. Guinea corn.
Cultivated as food for cattle. The word is Indian.

Saccharum officinarum, Linn. Sugar cane.
Introduced as early as 1623, but never cultivated to any extent,

although it was thought necessary in 1675 to pass a law to prevent the destruction of cedar for sugar boiling. It is now grown along the margins of water courses, chiefly for sale in sticks, and, not being manured or cultivated properly, possesses but little saccharine quality.

Phalaris Canariensis, Linn. Canary grass.

Grown for cage-birds.

Zea Mays, Linn. Indian corn.

Maize has been cultivated since the earliest settlement of Bermuda. It is mentioned in laws of 1622, and is still the only cereal grown for food. The writer frequently remarked "sports" such, as a bunch of stamens on the cob, or well-formed grains at the head of the plant, on the staminate flower.

Avena sativa, Linn. Oat.

"Grows well for a time, and then dies off before ripening seed. It is generally sown in ground intended for potatoes, and ploughed or dug in." (J. M. Jones.)

Triticum vulgare, Linn. Wheat.

"Grows well in some places, and produces a fair grain. In former years it was more extensively cultivated, and bread was frequently made in farm-houses, but of late years its cultivation has ceased." (*Id.*)

Hordeum vulgare, Linn. Barley.

"Grows well and ripens, but is seldom cultivated as a crop." (*Id.*)

CRYPTOGAMIA.

I.—Filices.

Adiantum cuneatum, Langs. et Fisch. Maiden-hair.

The only native *Adiantum;* universal on rocks where there is shade and moisture, and abundant. The species being Brazilian, not native either to the West Indies or to the United States, its establishment in Bermuda is a matter of some interest.

The following exotic *Adiantums* were cultivated at Mount Langton, and some of them planted out in promising localities about Paynter's Vale, with a view to their introduction: *Adiantum Capillus-Veneris*, Linn.; *A. caudatum*, Linn.; *A. concinnum*, H. D. K.; *A. cultratum*, J. Sen.; *A. Farleyense*, Moore.; *A. intermedium*, Swartz.; *A. macrophyllum*, Swartz.; *A. pedatum*, Linn.; *A. uniforme*, Linn.; *A. tenerum*, Swartz.; *A. trapeziforme*, Linn. *Adiantum pedatum*, Linn., which is a species of northern latitudes, barely lived in the fernery.

Pteris heterophylla, Linn.

Luxuriant and abundant at the Church Cave, but not often found elsewhere, and confined, as far as the writer's observation goes, to the Walsingham tract. It is a Brazilian and Central American species, but occurs in the West Indies also.

P. aquilina, Linn. Bracken.

General over the islands; especially abundant in Pembroke marsh. Perhaps the most universal of all ferns.

In addition to the above, *Pteris longifolia*, Linn.; *P. quadri-aurita*, Retz, and *P. serrulata*, Linnf., were cultivated at Mount Langton, and the first and last set out in suitable localities.

Acrostichum aureum, Linn. Marsh fern.

Abundant in brackish marshes, where it attains a great size. A fern of wide diffusion, found both in Florida and the West Indies. (*Chrysodium vulgare*, Fée.)

Woodwardia Virginica, Smith.

Found only in Pembroke marsh, and not very abundant. The young plants have a general resemblance to *Osmunda cinnamomea*, Linn., but may be distinguished at any stage by the loops in the veins parallel to the midrib of the *pinnæ*, which are radial in *Osmunda*. It is an American and not West Indian species.

Asplenium crenulatum, Fries.

Found chiefly in the Walsingham tract, and not very common. (*A. serratum*, Lindl.) A species of the West Indies and Central America.

A. Trichomanes, Linn.

Generally diffused; common to all northern, temperate, and tropical regions.

A. dentatum, Linn.

This pretty little fern is generally found at the mouths of caves, both in the Walsingham tract and elsewhere. It fills a cave on Grace's Island. It is a native of Florida and the West Indies.

A. myriophyllum, Presl. (*A. cicutarium*, Swartz, Sieb., Mart., 360, Hook., Metten.; *A. rhizophyllum*, Kunze, Hook.)

The rarest of Bermuda ferns; only found about the Church Cave. It is certainly not what is usually labeled *A. cicutarium* in collections. It is native to the West Indies and Southern United States. *Rhizo-*

phyllum seems misleading; it was labeled *Myriophyllum* at Cambridge, Mass., which describes it very well.

The following were also cultivated at Mount Langton: *Asplenium auritum*, Swartz; *A. cicutarium*, Swartz; *A. Fabianum*, Homb.; *A. firmum*, Fée; *A. Nidus; A. viviparum*, Presl.

Aspidium Capense, Willd. Devonshire marsh fern.

This beautiful fern is confined to a few spots of Devonshire marsh, and is in danger of extermination, not being abundant. The writer transferred some plants to Pembroke marsh, but they were not established. It requires much shade and moisture. Habitat, America from Cuba to Patagonia, South Africa, and Polynesia.

Nephrodium amplum, Baker.

Common by roadsides. A Central American and West Indian species.

N. patens, Desm.

Very common by roadsides; a fern which does not require moisture. Native of Florida, Texas, and Central America; not West Indian.

N. tetragonum, Hk.

Confined to the Walsingham tract, and not common. It belongs to Central America, and occurs neither in Florida nor the West Indies.

N. villosum, Presl.

Pretty abundant; one of the ferns found in dry places. It is native of the West Indies and Central America.

N. Thelypteris, Desv.

Found along the north side of Pembroke marsh, and not elsewhere; it dies down in winter. It is generally diffused in northern latitudes. *Nephrodium molle*, Desm., from the West Indies, was planted out in suitable places.

Nephrolepis exaltata, Schott.

Common among the rocks of Walsingham and elsewhere. The species belongs both to the United States and the West Indies.

Polypodium elasticum, Rich.

Found chiefly in the Walsingham tract, and not very common. (*P. cultratum*, Willd.) A native of Cuba and Central America.

Osmunda regalis, Linn.

Grows in abundance in Pembroke marsh; not found in the West Indies, but otherwise a fern of very wide range.

Osmunda cinnamomea, Linn.

Abundant also in Pembroke marsh. Native of the United States and the West Indies.

Blechnum occidentale, Linn.

Was planted out in suitable places in 1877.

Besides the ferns which have been enumerated above, the writer introduced and cultivated the following species, nearly all of which are readily grown with a little protection. The temperature of the air in the fernery by self-registering thermometers ranged from 48° to 87° in the year: *Anemia adiantifolia*, Sw.; *Cheilanthes microphylla*, Swartz; *Cystopteris bulbifera*, Bernh.; *C. fragilis*, Bernh.; *Davallia aculeata*, Swartz; *D. Canariensis*, Smith; *Dicksonia punctilobula*, Hook.; *Gymnogramme calomelanos*, Kaulf.; *G. sulfurea*, Desv.; *G. tartarea*, Desv.; *G. tomentosa*, Desv.; *Hemionitis palmata*, Linn.; *Lomaria gibba*, Labill.; *Onoclea sensibilis*, Linn. (which, however, did not flourish); *Pellæa Breweri*, Eaton; *P. hastata*, Link; *P. rotundifolia*, Hook.; *Polypodium aureum*, Linn.; *P. vulgare*, Linn. (brought from Ireland); *P. divergens*, Hook.; *P. Dryopteris*, Linn. (which did not flourish); *P. marginellum*, Sw.; *Scolopendrium vulgare*, Sm. (brought from Ireland); *Trichomanes crispum*, Linn. (which could not long be kept alive). This enumeration may have some interest for future horticulturists in Bermuda.

II.—EQUISETACEÆ.

Equisetum palustre, Linn.? Jointed marsh-weed.

Pembroke marsh. Common in West Indies and United States.

III.—LYCOPODIACEÆ.

Psilotum triquetrum, Sw.

Rare, but found about some of the caves in the Walsingham tract.

Selaginella Martensii, Spreng.

Found in gardens.

The following were also introduced from Kew: *S. Griffithsii*, Spreng.; *S. furcata*, Har.; *S. hæmatodes*, *S. inæquifolium*, *S. Martensii*, var. and *stolonifera*, Swartz; *S. viticulosa*, *S. Wallichii*; all of which grew well in a fernery.

IV.—CHARACEÆ.

Chara fœtida, A. Br.

This plant is abundant in wet ditches at Mount Langton.

V.—HEPATICÆ.

Jungermannia, sp.

Sphagnum palustre. Bog moss.

VI.—FUNGI.

The common mushroon, *Agaricum campestris*, Linn., appears rarely in Bermuda. They were to be found in 1852 near Pembroke church-yard. (Mr. Hurdis, in The Naturalist in Bermuda, p. 176.) The writer has, however, never seen them wild. They were grown at Mount Langton in an artificial cave from spawn imported from Halifax, and at times pretty abundant. The *fungi* of Bermuda, as an order, have not received attention.

Index of English or Local Names.

Page.
Abutilon, sweet 52
Alligator pear 101
Allspice 75
Almond, bitter 71
    sweet 71
Aloe 116, 118
    blue 116
    golden 116
Apple 72
Apricot 71
Arrowroot 111
Arsenic plant 106
Artichoke 83
Arum 114
Ash, West Indian 69
Asparagus 115
Atropha, gouty-stalked 105
Avocado pear 101

Bastard cedar 54
Balloon berry 98
Balm, common 98
Balsam 55
Bamboo 120
Banana 111
    dwarf 111
    old Bermuda 111
    red 111
Barbadoes aloe 116
    gooseberry 78
    lily 118
    pride 66
Barley 122
Basil 98
Baybean 66
Bay tree, sweet 102
Bedstraw 82
Beetroot 101
Bermuda cedar 108
Bermudiana 112
Birthwort 108
Blackberry, American 72
Black mangrove 97
    walnut 108
    willow 49
Bladder Senna 67
Bleeding heart 115
Bully 81
Blue gum 75
Bog moss 126
Borage 91
Bowstring hemp 117
Box 59

Page.
Box brier 81
Bracken 123
Bread fruit 103
Brier, Austrian 72
    sweet 72
Broom 62
Bryone, wild 77
Bunya-bunya 109
Burnet saxifrage 80
Burr 52, 54
Buttercup 46
Button tree 74
Button weed 82

Cabbage 48
Cabbage palm 113
Calabash tree 95
Camelia 52
Canary grass 122
Cancalis 79
Candelabra plant 49
Candleberry myrtle 104
Candy tuft 48
Cane 120
Canna, yellow 110
Cape gooseberry 92
    jasmine 81
    weed 84
Caricature plant 96
Cardoon 83
Carrion flower 89
Carrot 79
Cassava 106
Castor oil plant 106
Catnip 98
Catstail 115
Cauliflower 48
Cedar, Bermuda 108
Celery 80
Changeable rose 53
Charlock 48
Cherimoya 47
Cherry, French 55
Cherry pie 91
Chickweed 51
    water 51
Chicory 83
Christmas bush 68
Churchyard lily 118
Citron 57
Clematis 46
Clover, black medick 63
    red 64

Page.
Clover, white 68
Club-moss 119
Cocklebur 88
Cockroach berry 98
Cocoa nut 42
Coffee 114
Coral plant 108, 105
Cordia, scarlet 81
Coriandrum 70
Corrosa 52
Cotton plant 52
Cow cane 120
Cow cherry 98
Crab grass 121
Crane's bill 112
Cucumber 77
Custard apple 47
Cyperus, variegated 119
Cypress vine 90

Dandelion 83
Date palm 114
Day flower 119
Dead nettle 98
Demerara almond 74
Devil grass 120
Ditch weed 107
Dog bush 84
Dogwood 62
Dracaena, green 118
purple 118
Duck-weed 115
Dumb cane 115
Dutchman's pipe 108

Earth nut 64
Ebony, black 70
[illegible] 115
Egg plant 93
Elder, common 81
[illegible] lily 118

Fennel 80
Feverfew 85
Fleabane 84
Fiddle wood 97
Fig, common 102
Finger grass 121
Flag, wild 54
Flax, New Zealand 118
Fool's parsley 80
Forbidden fruit 57
Four o'clock 99
Fox-tailed grass 120
Frangipani 88
French bean 65
cherry 55
[illegible] 84
trumpet flower 88
Fuchsia 76
Fumitory, common 48

Galba 52
Garden chervil 79

Page.
Garden cress 48
Geranium, double 55
sweet-scented 55
Ginger lily 113
Ginger 111
Glasswort 101
Goat's weed .... (96), 84
Golden rod 84
Goosefoot family 101
Gorse 68
Governor plum 50
Grape fruit 57
Grapevine 60
Grass weed 113
Gromwell 81
Groundsel 85
Gru-gru 113
Guava 75
berry 75
Guernsey lily 118
Guinea corn 121
grass 121
pepper 98
yam 114

Hard grass 121
Hawthorn 72
Heal-soon 82
Heart's-ease 50
Heath 96
Hogwood 99
Holly 99
English 53
Hollyhock 53
Honey flower 55
Honeysuckle (cultivated) 80
fly 96
trumpet 98
Horse cherry 93
Horse-radish 48
Hyacinth 116

Ipecacuanha 89
India-rubber tree 103
Indian corn 122
shot 110
Indigo 63
Iris 112
Iron weed 79
Ivy, common 86
Italian 85

Jack-fruit 103
Japan medlar 73
Jasmine 87
white 87
yellow 87
Jerusalem artichoke 85
Jonquil 116
Joseph's coat 107
Justicia, blue 96
large, white 96

Laburnum 64
Lace plant 102

Page.
Lamb lettuce 82
Larkspur 46
Laurel 51
Laurestinus 80
Lavender 99
Lemon 56
Lemon grass 121
Lettuce 83
Li-chi 62
Lignum-vitæ 55
Lily, black 117
  day 117
Lip plant 73
Locust tree, red 67
  white 64

Mahoe 52
Magnolia 46
Mahogany 59
Maiden-hair 122
Mallow 52
Mammee apple 52
Mango 63
Mangrove, black 74
Marsh fern, Devonshire 124
  mint 123
  weed 113
Martinique laurel 58
Marvel of Peru 99
May weed 79
Melilot 64
Melon 77
Mercury 107
Mignonette 50
Mimosa, wild 69
  yellow 69
Mint, garden 98
  horse 98
  marsh 98
  wild 98
Meckery 107
Moon-plant 92
Morning glory 90
Mullein 95
Mulberry, paper 103
  red 103
  silkworm 103
Mushroom 126
Mustard, garden 48
  hedge 48
Myrtle, guava 75

Napoleon's plume 69
Nectarine 71
Nemophila 89
Nettle, common 102
  false 102
  small, stinging 102
Nettle tree 104
Nicker tree 68
Night-flowering cereus 78
Nightshade 93
Noyau vine 90
Nut grass 119

Page.
Oat 122
Okra 53
Oleander 88
Olive 88
Olive wood bark 59
Onion 115
Orache, sea 101
  bitter 57
Orange, Mandarine 57
  Seville 57
  sweet 57
  Tangerine 57
Osage orange 103
Otaheite gooseberry 106
  walnut 106
Oyster-plant 119

Palmetto 113
  dwarf 113
Pampas grass 121
Pansy 50
Papaw 76
Para grass 121
Parsley 80
Parsnips 79
Passion flower, wild 76
Pea, blue 65
  common 65
  purple 65
  spurred butterfly 65
  sweet 65
Peach 71
Pear 73
Pear, avocada 101
Pellitory 102
Pennywort, thick leaved 78
Pepper grass 48
  Spanish 63
Periwinkle 88
Persimmon 87
Petunia 94
Physic nut 105
Pigeon berry 97
  pea 64
Pimpernel 87
Pineapple 112
Pitcher plant 47
Plane, American 104
Plantain 111
Plum 71
  West Indian 71
Plumbago 86
Poinciana 67
Poison ivy 62
Poppy, opium 47
Pomegranate 75
Pork-fat apple 70
Potato, Irish 90
  sweet 98
Prickly burr 92
  pear 78
    tall 78
  myrtle 97
  sedge 119

Page.

- Pride of China 56
  - India 56
- Privet 88
- Pumpkin 77
- Purslane 51

- Quassia 55
- Queen of the shrubs 75
- Queen thistle 47
- Quince 73

- Radish 48
- Raspberry 72
- Red gum 72
- Rhubarb 100
- Rhus, walnut-leaved 63
- Rib-grass 99
- Roadside weed 99
- Rose, wild 72
- Rose apple 74
- Rosemary 99
- Rough chervil 79
- Rush 119
  - marsh 119

- Sage 97
  - common 97
  - prickly 97
  - red 97
- Sago palm 110
- Saintfoin 64
- Salvia, scarlet 98
- Samphire 83
- Sandwort, thyme-leaved 51
- Sappodilla 87
- Sarsaparilla 118
- Satinwood 59
- Screw-pine 114
- Scurvy grass 48
- Sea grape 100
  - lavender 91, 96
  - mulberry 74
  - orache 101
  - ox-eye 83
  - purslane 51
  - ragwort 85
  - turnsole 91
  - wrack 113
- Seaside vine 90
- Sensitive plant 69
- Shaddock 57
- Shell plant 111
- Shepherd's purse 48
- Silk cotton tree 53
- Silver tree 102
- Slipper plant 106
- Small shot 61
  - thatch 113
- Snake plant 115
- Snap weed, balsam 55
- Snow berry 81
  - flake 118
- Snuff plant 94
- Soap berry 62
- Sorrel, common 100

Page.

- Sorrel, purple 54
  - yellow 54
- Sour sop 47
- South sea grape 100
  - rose [illegible]
  - tea [illegible]
- Sow thistle [illegible]
- Spanish bayonet 116
  - broom [illegible]
  - pepper 63, [illegible]
- Speedwell 94
- Spider lily 113
  - root 119
- Spinach, New Zealand 110
- Spruce 110
- Spurge 121
- Squill [illegible]
- St. Andrews' Cross 51
- St. John wort [illegible]
- Stiff cornel [illegible]
- Star apple 87
- Star of Bethlehem [illegible]
- Stone crop 76
- Stock wild [illegible]
- Stopper 76
- Strawberry 72
- Succory [illegible]
- Sugar apple 47
  - cane 121
- Sunflower [illegible]
- Surinam cherry 74
- Sweet briar 72
  - pea [illegible]
- Sword plant [illegible]

- Tall prickly pear [illegible]
  - plum 104
- Tamarind [illegible]
- Tassel plant [illegible]
- Tea 94
- Thunbergia, white [illegible]
- Thyme [illegible]
- Tittimelly [illegible]
- Toad-flax 94
- Tobacco [illegible]
- Tomato [illegible]
- Tous-les-mois 111
- Tuberose 113
- Trumpet flower [illegible]
  - red [illegible]
- Tulip tree [illegible]
- Turkey berry [illegible]
- Turk's cap 77

- Vanilla, sweet [illegible]
- Verbena, white [illegible]
- Vervain [illegible]
- Violet, sweet [illegible]
- Virginia creeper [illegible]
- Vitch [illegible]

- Wall flower [illegible]
- Wampee [illegible]
- Wart, cress [illegible]
- Water-cress [illegible]

Page.
lemon 76
melon 77
lant 59
122
cedar 95
sedge 120
rane's bill 55
, black 49
Caraccas 105

Page.
Willow, weeping 105
Wire grass 120
weed 52
Wistaria 64
With 64
Wormwood, wild 84

Yam 118
Yellow canna 110

INDEX OF BOTANICAL NAMES.

Page.
C. *Abutilon pulchellum*, Sweet 52
C. striatum, Dicks 52
C. Acacia Arabica, Willd 70
C. *cygnorum*, Meissn 70
C. Lebbek, Willd 70
C. *macracantha*, H. B 70
C. Acalypha tricolor, Hort 106
C. ACANTHACEÆ 95
C. Achimenes, sp 95
A. Acrostichum aureum, Linn 123
C. *Adenocarpus telonensis*, DC 66
A. Adiantum cuneatum, Langs. et Fisch 122
C. capillus veneris, Linn 122
C. concinnum 122
C. cultratum 122
C. Farleyense 122
C. intermedium 122
C. macrophyllum 122
C. pedatum 122
C. uniforme 122
C. tenerum 122
C. trapeziforme 122
B. Agaricus campestris, Linn 126
C. Agave Americana, Linn 116
C. *Jaquiniana*, Sch 116
C. Mexicana, Lam 116
C. striata, Zucc 116
C. variegata, Hort 116
A. *Xylonacantha*, Salm 116
B. Ageratum conyzoides, Linn 83
B. Mexicanum, Sweet 83
C. Ailanthus glandulosa, Desf 56
B. Albizzia Lebbek, Benth, syn 70
C. Aleurites triloba, Forst 106
C. *Allemanda Schottii*, Pohl 88
C. Allium Cepa, Linn 115
C. Aloe soccotrina, Lam 116
A. vulgaris, Lam 116
B. Alopecurus pratensis, Linn 120
C. Aloysia citriodora, Orteg 96
C. Alpinia nutans, Rosc 111
B. Althea rosea, Cav 53
AMARANTACEÆ 100
B. Amarantus hybridus, Linn 100
B. Amarantus spinosus, Linn 100
C. Amaryllis equestris, Ait 118
C. Amaryllis Sarniensis, Linn 118
B. Ambrosia artemisiæfolia, Linn 86
B. Ambrosia heterophylla, Mhlbrg 86
C. *Amorphophallus*, sp 115
AMPELIDEÆ 60
A. Ampelopsis quinquefolia, Michx 61
C. *tridentata*, Thun 61

Page.
C. *Amygdalus amara*, Hort 71
C. *communis*, Linn 71
C. *nectarina*, W 71
C. Persica, Linn 71
C. *Ananassa sativa*, Mill 112
C. Anagallis arvensis, Linn 87
A. Andropogon schænanthus, Linn 121
C. Anethum graveolens, Linn 79
C. Angelica Archangelica, Cham. & Schl 79
B. Anthriscus vulgaris 79
C. *Anthyllis Barbajovis*, Linn 66
C. *Anthurium cordifolium*, Kth 115
C. *Antigonon leptopus*, Hook & An 100
ANONACEÆ 47
C. Anona Cherimolia, Mill 47
C. muricata, Linn 47
C. reticulata, Linn 47
C. squamosa, Linn 47
B. tripetala, Ait, syn 47
C. Apium graveolens, Linn 80
leptophyllum, F. M., syn 80
Petroselinum, Linn., syn 80
APOCYNEÆ 88
C. Arachis hypogœa, Linn 64
ARALIACEÆ 80
C. *Aralia Guilfoylia*, Hort 80
C. *Araucaria Bidwellii*, Hook 109
Ardisia acuminata, Willd 87
C. *humilis* Vahl 87
C. *Areca Catechu*, Linn 114
B. Arenaria serpyllifolia 51
A. Argemone Mexicana, Linn 47
C. *Argyrolobium androsæmifolium* 66
ARISTOLOCHIACEÆ 108
C. Aristolochia trilobata, Linn 108
AROIDEÆ 114
B. Artemisia tenuifolia, Willd., syn 84
C *Artocarpus incisa*, Linn 103
C. *integrifolia*, Linn., f 103
A. Arundinaria tecta, Mhlbrg 120
C. Arundo Donax, Linn 120
Aschynomene, sp 63
ASCLEPIADEÆ 89
A. Asclepias curassavica, Linn 89
B. *nivea*, Linn 89
A. Ascyrum Crux-Andreæ, Linn 51
hypericoides, Linn., syn 51
C. *Asparagus Natalensis*, Hort 115
C. officinalis, Linn 115
A. Aspidium capense, Willd 124
C. Asplenium 124
C. auritum 124
C. cicutarium 124

Page.
A. Asplenium crenulatum, Fries ... 123
A. dentatum, Linn ... 123
C. Fabianum ... 124
C. firmum ... 124
A. myriophyllum, Presl ... 123
C. Nidus ... 124
A. trichomanes, Linn ... 123
C. viviparum ... 124
B. Aster trifolium, Linn ... 84
C. Astrocaryum aureum, Griseb ... 113
A. Atriplex cristata, H. B ... 101
AURANTACEÆ
C. *Avena sativa*, Linn ... 122
A. Avicennia nitida, Linn ... 97
A. tomentosa, Linn., syn ... 97
C. *Azalea viscosa*, Linn ... 86
B. Baccharis halimifolia, Linn., syn ... 84
A. heterophylla, H. B. K ... 84
BALSAMINEÆ
C. *Balsamocarpon brevifolium*, Chois ... 66
B. Bambusa vulgaris, Wendl ... 120
C. Batatas Edulis, Chois ... 90
C. Bauhinia parviflora, Vahl ... 69
C. *Vahlii*, Wight ... 69
C. *Beaumontia grandiflora*, Wall ... 89
BEGONIACEÆ ... 77
C. Begonia fuchsioides, Hook ... 77
C. hydrocotylifolia, Grah ... 77
C. Rex, Pritz ... 77
C. ulmifolia, Willd ... 77
C. *Benthamia fragibera*, Lindl ... 81
C. *Beta vulgaris*, Linn ... 101
B. Bidens leucanthus, W. var. discoideus ... 83
BIGNONIACEÆ ... 95
C. Bignonia capreolata, Linn ... 95
D. *Billburgia farinosa*, Hort ... 112
D. *tinctoria*, Mart ... 112
D. *Biota Nepaulensis*, Endl ... 109
D. *orientalis*, Don ... 109
BIXINIEÆ ... 50
D. *Bixa Orellana*, Linn ... 50
D. *Blechnum occidentale*, Linn ... 125
D. *Blighia sapida*, Kœn ... 62
B. Boerhavia erecta, Linn ... 99
A. Bœhmeria cylindrica, Willd ... 102
C. Bombax Ceiba, Linn ... 53
BORAGINEÆ ... 91
C. Borago officinalis, Linn ... 91
B. Borreria lævis, Griseb ... 82
A. Borrichia arborescens, DC ... 83
putescens, DC., syn ... 83
C. *Bougainvillea spectabilis*, Willd ... 99
C. *glabra* ... 99
A. *Boussingaultia basselloides*, H. B ... 101
C. *Brassica botrytis* ... 48
C. *capitata* ... 48
oleracea, Linn ... 48
BROMELIACEÆ ... 112
D. *Brownea grandiceps*, Jacq ... 69
C. Brugmonsia suaveolens, Willd ... 92
D. *Brunfelsia Americana*, Linn ... 92
C. *Bryophyllum calycinum*, Salisb ... 73
C. Buddleia Neemda, Roxb ... 94
CACTEÆ ... 77
Cactus. *See* Opuntia, Sw.

Page
C. Cactus Elata, Sur
C. Gilliesii, Wall
C. Cæsalpinia pulcherrima, Sw
B. Cajanus indicus, Spreng
A. Cakile æqualis, Herit
A. maritima, Scop
C. *Caladium*
B. Calamintha Nepeta, Linn
A. Callicarpa ferruginea, Sw
C. Calophyllum calaba, Jacq
C. *Camellia japonica*, Linn
A. Canavalia obtusifolia, DC
CANNACEÆ
C. Canna coccinea, Ait
C. edulis, Ker
C. indica, Linn
C. lutea, Ait
CAPPARIDACEÆ
B. Capparis torulosa, Swartz
C. Capraria biflora, Linn
CAPRIFOLIACEÆ
C. Caprifolium Italicum, R. S
C. sempervirens, Michx
B. *Capsella Bursa-pastoris*, Moh
C. Capsicum annuum, Linn
C. frutescens, Linn
A. Cardiospermum Halicacabum, Linn
B. Carica Papaya, Linn
C. *Carludovica palmata*, R. P
CARYOPHYLLEÆ
C. *Caryota Cummingii*, Lodd
C. Casparea porrecta, Kth
C. Cassia bacillaris, Linn
C. bicapsularis, Linn
C. *Corymbosa*, Lam
C. Cassia fistula, Linn
C. glauca, Lam
C. ligustrina, Linn
C. occidentalis, Linn
CASUARINEÆ
C. Casuarina equisetifolia, Linn. f
C. Catalpa corallodendron, syn
CELASTRACEÆ
CELTIDEÆ
A. Celtis mississippiensis, Bosc
occidentalis, Linn., syn
A. Cenchrus echinatus, Linn
A. tribuloides, Linn
A. *Centaurea gymnocarpa*, Moris. and Not.
B. *Centranthus macrosyphon*, Bots
A. Centrosema Virginianum, Benth
B. Cerastium viscosum, Linn
C. Ceratonia tiliqua, Linn
CERATOPHYLLEÆ
Cerbera Theoctia, Linn., syn
C. Cereus grandiflorus, Mill
C. triangularis, Haw
C. *Cestrum parqui*, Linn
A. Chamærops Palmetto, Michx
C. Chærophyllum sativum, Gaertn
CHARACEÆ
A. Chara fœtida, A. Br
C. Cheiranthus Cheiri, Linn
CHENOPODIEÆ
B. Chenopodium ambrosioides, Linn

Page.
ium album, Linn 101
anthelminticum, Linn 101
racemosa, Linn 81
***rœa*, Sw** 120
***m Swietenia*, DC** 59
anus pellocarpus, Meyer 70
m aureum, Fée, syn ....
llum Cainito, Linn 87
cha, Linn 106
Intybus, Linn 83
maritima, Linn 85

lon quadrangulare, Linn 97
ulgaris 77
***rantium*, Linn** 57
aradia, Loist 57
ifolia, Poir 57
umanus, Linn 57
tta, Risso 56
nonum, Risso 56
***dica*, Linn** 57
ilis, Lour 57
emosus, Ris et Poit 57
***osissima*, Meyer, syn** 56
garis, Risso 57
***olor*, Blum** 61
***rifolius*, Linn** 50
***speliensis*, Linn** 50
***ifolius*, Linn** 50
ccidentale, Schrald 119
***irginiana*, Linn** 46
***Jackmanni*, Hort** 46
***ngens*, Willd** 49
eciosa, H. B 39
ron capitatum, Schum. & Torr. 97
aculeatum, Gr 97
rasiliana, Arrab 65
ernatea, Linn 65
***ndens*, Cav** 89
platyclada, Hook 100
uvifera, Linn 100
ifera, Linn 114
***bica*, Linn** 82
.... 98
esculenta, Schott 115
Asiatica, Brongn 60
***borescens*, Linn** 67
CAE 74
EÆ 119
a agraria, Kth 119
cayennensis, Rich 119
Æ 83
.... 108
us erectus, Jacq 74
racemosus, Linn., syn 74
LACEÆ 90
lus sagittifolius, syn 91
bida, Willd, syn 84
nbigua, DC., syn 84
nctata, Retz 58
bestana, Linn 91
***angustifolia*, Hort** 118
m sativum, Linn 79

Page.
CORNACEÆ 80
C. *Cornus stricta*, Lam 80
CRASSULACEÆ 73
C. *Cratægus pyracantha*, Pers 72
B. Crepis lyrata, Froel 83
C. *Crescentia Cujete*, Linn 95
C. Crinum cruentum, Ker 118
C. Croton *Angustifolium*, Hort 106
C. *Cornatus*, Vell 106
C. discolor, Rich 106
C. maritimum, Walt 106
C. *pictum*, Hort 106
C. *tenœum*, Mullty 106
C. variegatum, Forsk 106
C. *undulatum* 106
CRUCIFERÆ 48
C. *Cryptomeria elegans*, Veitch 110
C. Cucumis Melo, Linn 77
C. Cucumis sativus, Linn 77
CUCURBITACEÆ 77
C. Cucurbita Pepo, Linn 77
C. Melopepo, Linn 77
C. moschata, Linn 77
C. Citrullus, Linn., syn 77
C. Cupania fulva, Mart 61
C. Cupressus funebris, Endl 109
C. *Lawsoniana*, Murr 109
C. *macrocarpa*, Hartw 109
torulosa, Lamb 109
CYCADEÆ 110
C. Cycas revoluta, Thunb 110
C. Cydonia vulgaris, Pers 73
C. *Cynara Cardunculus*, Linn 83
B. Cynodon Dactylon, Pers 120
CYPERACEÆ 119
C. Cyperus alternifolius, Linn 119
C. flexuosus, Vahl 119
C. rotundus, Linn 119
C. *Cyrtanthera rosea*, Hort 96
C. *Cyrtanthus catalpæfolia*, Nees 117
C. *Cytisus Laburnum*, Linn 64
C. *Dahlia superflua*, Ait 85
Datura fastuosa 92
metel 92
A. *Stramonium*, Linn 92
C. suaveolens, H. B 92
B. Tatula, Linn 92
C. *Daucus Carota*, Linn 79
C. Delphinium 46
A. Desmanthus virgatus, Willd., syn 69
C. Desmodium gyrans, Linn 64
A. virgatum, Desv 64
C. Deutzia scabra, Thunb 73
A. Dichondra Carolinensis, Michx 91
A. Dichondra repens, Forst 91
C. *Dieffenbachia seguine*, Schott 115
C. Digitaria setigera, Rth 121
C. Dimocarpus Litchi, Lour 62
DIOSCOREÆ 113
C. Dioscorea sativa, Linn 113
C. lutea, Meyer 113
C. *Diospyros Mabola*, Roxb 87
C. Diospyros virginiana, Linn 87

INDEX OF BOTANICAL NAMES.

Page.
C. *Dipteracanthus affinis*, Nees 90
A. Dodecandria trigynia 106
A. Dodonæa angustifolia, Lam., syn 62
A. Dodonæa viscosa, Linn 62
C. *Dolichos Lablab*, Linn 66
C. Dracæna australis, Forst (Sp. New Caledonia) 118
C. Dracona terminalis, Linn 118
C. Duranta Plumieri, Linn 97
EBENACEÆ 87
C. *Echeveria gibbiflora*, *DC.*, var. *metallica*. 73
Alba, Hassk, syn 83
A. Eclipta erecta, Linn 83
A. (orientale) Jacq., syn 59
C. Eleusine indica, Gaert. 120
Entada scandens, Benth 66
EQUISETACEÆ 125
A. Equisetum palustre, (?) Linn 125
Eranthemum Andersonii, Mast 96
pulchellum, Andr 96
ERICACEÆ 86
B. Erigeron animum. Linn., syn 84
B. Bonariensis, Linn 84
B. canadensis, Linn 84
B. trifolium, Willd 84
B. Philadelphicum, Linn 84
B. quercifolis, Lam 84
C. Eriobotrya japonica, Lindl 73
Eriodendron anfractuosum, DC., syn 54
C. *Erythrina caffra*, Thunb 68
C. Crista-galli, Linn 68
C. corallodendron, Linn 68
C. *herbacea* 68
C. Indica, (?) Lam 68
C. speciosa, Andr 68
C. velutina, Willd 67
B. Erythrea centaurium, Pers 89
C. *Eucalyptus coriacea*, Cum 75
C. *globulus*, Labil 75
C. *resinifera*, Smith 75
C. *Euclearis Amazonica*, Lindl 117
C. *Eucomis regia*, Ait 117
A. Eugenia axillaris, Poir 74
C. jambos, Linn., syn 74
C. Malaccensis, Linn 75
C. Michelii, Lam., syn 74
C. uniflora 74
C. Euonymus Japonica, Linn 59
B. Eupatorium conyzoides, Vahl 83
B. fœniculaceum, Willd 83
EUPHORBIACEÆ 105
A. Euphorbia buxifolia, Lamck 107
C. Candelabrum, Trem 107
A. glabrata, Sw 107
A. hetorophylla, Linn 107
A. hypericifolia, Linn 107
C. *Jaquinæflora*, Hook 107
A. maculata, Linn 107
B. *Peplus*, Linn 107
A. prostrata, Ait 107
C. splendens, Bojer 107
B. Fedia olitoria, Gaert 82
B. Ferula communis, Linn 80
C. glauca, Linn 80

FICOIDEÆ
C. *Ficus aurata*, Miq
C. elastica, Roxb
FILICES
C. *Fittonia argyroncara*, Coem
C. *Flacourtia prunifolia*, H. B
C. *Ramontchi*, Herit
C. Fœniculum dulce, B. C
vulgare, Gaert., syn
A. Forestiera porulosa, Poir
C. Fourcroya gigantea, Vent
C. *Fragraria virginiana*, Ehrh
C. Fuchsia coccinea, Linn
FUMARIACEÆ
B. *Fumaria officinalis*, Linn
B. Galium rubrum, Endl
B. uniflorum, Michx
C. *Gardenia florida*, Linn
C. *Fortunii*
C. *nitida*, Hook
C. Gasterica maculata, Haw
C. obliqua, Haw
C. Gazania spendens, H. K
C. Gaura coccinea, Fras
GENTIANEÆ
GERANIACEÆ
B Geranium dissectum, Linn
B. pusillum, Linn
GESNERIACEÆ
B. Geum radiatum, Michx
C. Gladiolus
Gloxinia
C. Glycosmis citrifolia, Lindl., syn
C. pentaphylla, Carr
GOODENIACEÆ
B. Gossypium *album*
herbaceum, Linn
nigrum
GRAMINEÆ
C. Graptophyllum versicolor, Hort
C. Guaiacum officinale, Linn
C. Guazuma tomentosa, H. B
A. Guilandina Bonducella, Linn
GUTTIFERÆ
C. *Gymnogramme tartarea*, Desv
GYMNOSPERMÆ
C. Gynerium argenteum, Nees
C. *Hardenbergia digitata*, Lindl
C. *Haworthia tortuosa*
C. Hedera helix, Linn
C. *Hedychium speciosum*, Wall
C. Hedysarum onobrychis, W
C. Helianthus annuus
C. tuberosus, Linn
A. Heliotropium curassavicum, Linn
C. Peruvianum, Linn
C. Hemerocallis fulva, Linn
A. Herpestis monniera, H. B
C. Hibiscus Bancroftianus
C. *Cooperii*, Hort
C. grandiflorus, Michx
C. esculentus, Linn
C. mutabilis, Linn
C. populneus, Linn

Page.
osa-Sinensis, Linn 53
iliaceus, Linn. 52
splendens, Hort., syn 81
ia splendens, Benth 81
vulgare, Linn 122
osa, R. Br 89
itana, Linn 106
s orientalis 117
s, hortensis Sm 73
le Asiatica, Linn., var 79
repanda, Pers 79
umbellata, Linn 79
CEÆ 89
Vershafeli, Wendl 114
EÆ 51
acea, Ait 48
59
olium, Linn 59
e, Linn 59
oria, Ait., syn 59
hortensis (?) 55
Anil, Linn., syn. tinctoria, 63
Willd 70
issecta, Poir 90
amaicensis, Don 90
earii, Paxt 90
il, Pers 90
es-Capræ, Roth 90
rpurea, Lam 90
gittifolia, Pursh 91
difolia, Schrad 91
berosa, Linn 90
llosa, R. P 90
112
rbstii, Hook 100
eæ. Sweet 112
ica, Linn 112
Boveii 117
epens, DC 76
ninata, Roxb 82
oynensis, DC 82
inea, Linn 81
anica, DC 82
alaccensis, LC., syn 75
ulgaris, DC 74
87
n, Linn 87
gracile, Andr 87
officinale, Linn 87
Sambac, Ait 87
Curcas, Linn 105
atropha, Linn 105
ultifida, Linn 105
panduræfolia, Andr 105
podagrica, Hook 105
Æ 108
igra, Linn 108
119
aritimus, Lane 119
nuis, Willd 119
nnia 126
Barbadensis, Thunb 108
Bermudiana, Linn 108
ba, Roxb 95

Page.
C. Justicia Ecbolium, Linn 96
C. lucida, Nees. Sauquinea, H. B. 96
C. *Kalanchoe* 78
B. Kleinia repens, Haw 83
C. *Koelreuteria paniculata* 62
A. Kosteletzkya Virginica (Hibiscus, Linn) 52
B. Kyllingia monocephala, Linn 119
LABIATÆ 98
C. Lactuca sativa, Linn 83
A. Laguncalaria racemosa, Gært 74
C. Lagerstræmia Indica, Linn 75
B. *Lamium amplexicaule*, Linn 98
B. purpureum, Linn 98
C. Lantana aculeata, Linn 97
C. camara, Linn 97
C. crocea, Jacq 97
C. odorata, Linn 97
C. Lathyrus odoratus, Linn 65
LAURINEÆ 101
C. Laurus nobilis, Linn 102
C. Carolinianum, Michx 102
C. Lavandula spicata, DC 99
LEGUMINOSÆ 63
A. Lemna minor, Linn 115
A. trisulca, Linn 115
B. Leonurus Sibericus, Linn 99
B. cardiaca, Linn 99
Lepidium ruderale, Linn, syn 48
B. sativum, Linn 48
B. Virginicum, Linn 48
B. Leptochloa mucronata, Kth 120
C. Liriodendron tulipifera, Linn 46
C. Leucæna glauca, Benth 69
C. *Leucodendron argenteum*, R. Br 102
C. Leucoium æstivum, Linn 118
C. Ligustrum vulgare, Linn 88
LILIACEÆ 115
C. Lilium candidum, Linn 117
C. japonicum, Thunb 117
LINACEÆ 54
C. *Linaria Elatine*, Desf, var. E 94
vulgaris 94
C. Linum usitatissimum, Linn 54
A. Lippia micromera, Schauer 96
A. nodiflora, Rich 96
A. reptans, *H*. B 96
A. Lithospermum distichum, Orteg 91
C. *Livistona* Chinensis, Mart 114
C. *rotundibolia*, Hort. Lindl 114
LOBELIACEÆ 86
C. Lobelia cardinalis, Linn 86
C. Lonicera xylosteum, Linn 80
C. Lophospermum erubescens, Don 94
B. Lucuma mammosa, Linn. 52
C. Lyceum vulgare, Dun. 94
C. Lycopersicum esculentum, Mill., syn 93
LYCOPODIACEÆ 125
LYTHRARIEÆ 75
C. Maclura aurantiaca, Nutt 103
C. xanthoxylon, Endl 104
MAGNOLIACEÆ 46
Magnolia glauca, Linn 46
C. grandiflora, Linn 46
purpurea, Curt 46
A. Malcolmia maritima, R. Br 48

Page.
MALPIGHIACEÆ 55
C. Malpighia punicifolia, Linn 55
C. setosa, Spr 55
MALVACEÆ 52
C. Mammea Americana, Linn 52
C. Mangifera indica, Linn 63
C. Maranta arundinacea, Linn 111
C. *Marrubium vulgare*, Linn 98
Martinezia caryotaefolia, H. B 114
C. Mathiola incana, R. Br 49
C. Maurandia Barclayana, Bot. Reg 94
C. semperflorens, Jacq., var. E .. 94
B. Medeola Virginica, Linn 117
B. Medicago denticulata, Willd 63
B. lupulina, Linn 63
B. maculata, Willd 63
B. muricata, All 63
MELIACEÆ 85
C. Melia Azedarach, Linn 58
C. Melianthus major, Linn 55
B. Melilotus alba, Koch 64
B. officinalis, Linn 64
B. parviflora, Desf 64
C. Melissa calamintha, Linn 98
C. officinalis, Linn 98
C. Melocactus communis, DC 77
B. Mentha arvensis, Linn 98
B. rotundifolia, Linn 98
B. viridis, Linn 98
B. Mercurialis annua, Linn 107
Mesembrianthemum, sp 78
C. *acinaceforma*, Linn 78
C. *candens*, Haw 78
C. *caulescens*, Haw 79
C. *depressum* 78
C. *edulis*, Linn 78
C. *emarginatum*, Linn 79
C. *heterophyllum*, Haw 78
C. *multiflorum*, Haw 78
C. *muricatum*, Haw 79
C. *rhomboideum*, Salm 79
C. *subinacanum* 79
C. *tenuifolium*, Linn 79
C. *uncatum*, Salm 78
C. *uncinatum*, Linn 79
C. *vaginatum*, Haw 78
C. *violaceum*, DC 79
C. Mimosa pudica, Linn 69
C. Mirabilis dichotoma, Linn 99
C. Jalapa, Linn 99
A. Montia fontana, Linn 51
MOREÆ or MORACEÆ 102
MORINGEÆ 50
MONOCOTYLEDONS 110
A. Morinda roioc, Linn 82
C. Moringa pterygosperma, Gaert 50
C. Morus macrophylla, Hort 103
C. multicaulis, Perrot 103
C. rubra, Linn 103
MUSACEÆ 111
C. Musa Cavendishii, Paxton 111
C. paradisiaca, Linn 111
C. sapientum, Linn 111
C. rosacca, Jacq 111
C. Murraya exotica, Linn 58

Page.
A. Myginda Rhacoma, Sw 59
MYRICEÆ 104
A. Myrica cerifera, Linn 104
punctata, DC., syn 104
C. Myrospermum perniferum, DC 68
MYRSINÆ 87
MYRTACEÆ 74
NAIADEÆ 113
A. Nama Jamaicensis, Linn 89
C. Narcissus Jonquilla, Linn 117
C. Nasturtium officinale, R. Br 48
C. Nemophila insignis, Benth 89
A. Nepeta Cataria, Linn 98
C. Nephelium Litchi, G. Don 62
A. Nephrolepis exaltata, Schott 134
A. Nephrodium amplum, Baker 124
A. patens, Desv 124
A. tetragonum, Hook 124
A. villosum, Prest 124
C. Nerine pulchella, Herb 118
C. *Nerium Oleander*, Linn 88
B. Nicandra physaloides, Gaert 94
C. Nicotiana glauca, Grah 92
C. tabacum, Linn 92
NYCTAGINIÆ 99
NYMPHEACEÆ 47
C. *Nympha cærulea*, Savign 47
C. *dentata*, Sch. & Thonn 47
A. Obione cristata, Moquin, syn 101
A. Œnothera biennis, Linn 76
A. *humifusa*, Nutt 76
A. longiflora(?), Jacq 76
A. rosea, Ait 76
A. *sinuata*, Linn 76
C. Ocimum basilicum, Linn 98
C. Olea Europæa, Linn 88
OLEACEÆ 88
ONAGRARIEÆ 76
C. *Oncidium Papilio*, Lindl 112
C. Opuntia coccinellifera, Mill 78
C. *dejecta*, Salm 78
C. Ficus indica, Mill 78
C. *flavicans*, Lemair 78
C. *integrifolia* 78
C. *longifolia* 78
C. *megacantha*, Salm 78
Pes Corvi, Lecompte 78
C. *tomentosa*, Salm 78
C. Tuna, Mill 78
C. vulgaris, Mill 78
ORCHIDEÆ 114
C. Oreodoxa oleracea, Mart 113
C. Ornithogallum latifolium, Linn 117
A. Osmunda cinnamomea, Linn 12
A. regalis, Linn 12
OXALIDEÆ.
B. Oxalis corniculata var. stricta, Linn 54
B. *coruna*, Thunbg 54
B. microphylla, St. Hil 54
B. violacea, Linn 54
PALMÆ 113
C. Pancratium ovatum, Mill 118
PANDANEÆ 114
C. Pandanus odoratissimus, Linn 114
C. utilis, Borg 114

Page.
itchi i, Lem 114
vifolium, Kunth 121
villare, Linn 121
sare, Burm 121
ximum, Jacq 121
lle, Swartz 121
iegatum 121
gatum, Linn 121
Æ 47
niferum, Linn 47
bilis var. Floridana Forst 102
r. *triplineroiis*, Don., syn ....
Hysterophorus, Linn 86
stichum, Burm 120
iforme, Nees 120
torale ?, R. Br., syn 120
staceum, Michx 120
E 76
liata, Ait 76
rulea, Linn 77
ulis, Linn 77
urifolia, Linn 76
aliformis, Linn 76
adrangularis, Linn 76
inceps, Todd 77
tiva, Linn 79
Lindl 62
ifex, Cuv 52
tithymaloides, Poit 106
leata ? 78
o, DC 78
.... 107
btusifolia 107
ssima, Gaert 101
a 102
a sativum, Hoffm 80
ninata, Graham 94
nicea, Juss 94
geata, Hook ....
ariensis, Linn 122
, syn 65
lgaris, Linn 65
lacerum, Schott 115
Æ 73
ylifera, Linn 114
max, Forst 118
ostachya 96
ata, Cass 60
ulata, Linn 93
lis, Sims 92
nta, Dun., syn 93
ceolata, Michx., syn 93
uviana, Linn., syn 92
escens, Linn 93
Æ 99
macrocarpa, R. P 114
ifolia, Wedd 102
a, Wight 75
garis, Lindl 75
aterifolia, Link 80
ensis, Grisebt 110
Ait 109
lia, Lamb 109
Linn 109
iana, Dougl 109

Page.
PIPERACEÆ 107
C. Pisum sativum, Linn 65
C. *Pithecolobium Saman*, Benth 68
PITTOSPOREÆ 50
C. Pittosporum coriaceum, Ait 50
C. undulatum, Vent 51
PLANTAGINEÆ 99
B. Plantago *lanceolata*, Linn 99
B. *major*, Linn 99
B. virginica, Linn 99
PLATANACEÆ 104
C. Platanus occidentalis, Linn 104
A. Pluchea odorata, Cass 85
A. purpurascens, DC 85
PLUMBAGINEÆ 86
C. Plumbago capensis, Thunb 86
C. *coccinea*, Boiss 86
C. *rosea*, Linn 86
C. Plumieria rubra, Linn 88
Poinciana pulcherrima, Linn., syn 66
C. regia, Bojer 67
C. Poinsettia pulcherrima, Graham 105
POLEMONIACEÆ 89
C. Polianthes tuberosa, Linn 118
POLYGONEÆ 100
A. Polygonum acre, H. B. 100
B. Polymnia uvedalia, Linn 86
A. *Polypogon Monspeliensis*, Desf 120
A. Polypodium cultratum, Willd 124
A. elasticum, Rich 124
A. Portulaca oleracea, Linn 51
PRIMULACEÆ 87
Pritchardia pacifica, Seem 114
PROTEACEÆ 102
Prunus armeniaca, Linn 71
C. *domestica*, Linn 71
C. *occidentalis*, Sw 71
C. *sphærocarpa*, Sw 71
C. Psidium cattleianum, Sabin 75
C. cordatum, Sims 75
C. guayva, Radd 75
pomiferum, Linn., syn 75
pyriforme, Linn., syn 75
A. Psilotum triquetrum, Sw 125
C. *Psoralea glandulosa*, Linn 66
C. Psychotria undata, Jacq 82
A. Pteris aquilina, Linn 123
A. heterophylla, Linn 123
C. Punica Granatum, Linn 75
B. Pycnanthemum muticum, Pers 98
C. Pyrethrum parthenifolium, Willd 85
C. *Pyrus communis*, Linn 78
C. *malus*, Linn 72
C. *Quassia amara*, Linn 55
C. Quamoclit coccinea, Mœnch 90
C. vulgaris, Chois 90
C. *Quercus alba*, Linn 108
C. *aquatica*, Walt 108
C. *Catesbæi*, Michx 108
C. *cinerea*, Michx 108
C. *nigra*, Linn 108
A. Randia aculeata, Linn 81
latifolia, Lam., syn 81
RANUNCULACEÆ 46
B. Ranunculus muricatus, Linn 46

Page.

B. Ranunculus parviflorus, Linn 46
C. Raphanus sativus, Linn 48
Renealma occidentalis, Gr., syn 111
RESEDACEÆ 50
C. Reseda odorata, Linn 50
A. Rhachicallis rupestris, DC 82
RHAMNEÆ 60
C. Rhapis flabilliformis, Linn 114
C. Rheum Rhaponticum, Linn 100
RHIZOPHORÆ 74
A. Rhizophora mangle, Linn 74
C. *Rhododendron*, sp 86
A. Rhus excisa, Thunb 62
C. *juglandifolia*, Willd 63
A. toxicodendron, var. radicans., Linn. 62
A. Rhynchospora florida, A. Dietr 120
A. pura, Grah 120
A. stellata, Gr 120
C. Richardia Æthiopica, Kunth 114
A. *Ricinus communis*, Linn 106
C. Robinia dubia, Fonc., syn 64
C. Pseudacacia, Linn 64
C. *Rondeletia odorata*, Loddig 81
ROSACEÆ 70
C. Rosa Carolina, Linn 72
C. damascina, Linn 72
C. lævigata, Michx 72
C. lutea, Brot 72
C. rubiginosa, Linn 72
C. spinosissima, Linn 72
C. Rosmarinus officinalis, Linn 99
RUBIACEÆ 81
Rubus idæus, Linn 72
B. Rumex Acetosella, Linn 100
B. obtusifolius, Linn 100
A. Ruppia maritima, Linn 113
C. Russelia juncea, Zuccar 95
RUTACEÆ 55
A. *Sabal Adansoni*, Guerus 113
C. (Sp.) (*carat* palm) 113
C. *mucini* 113
A. Palmetto, Lodd 113
C. Saccharum officinatum, Linn 121
Salicornia ambigua, Michx., syn 101
A. fruticosa var., Linn 101
herbacea, Linn., syn 101
SALICINEÆ 105
C. Salix Babylonica, Linn 105
C. Humboldtiana, Willd 105
B. Salvia coccinea, Linn 98
occidentalis, Sw., syn 98
B. serotina, Linn 68
C. splendens, Ker 98
C. Sambucus nigra, Linn 81
C. Sanseviera Guineensis, Willd 118
SAPINDACEÆ 61
C. Sapindus longifolius, Vahl 62
C. saponaria, Linn 62
SAPOTEÆ 87
C. Sapota Achras, Mill 87
SARRACENIACEÆ 47
C. *Sarracenia purpurea*, Linn 47
SAXIFRAGEÆ 73
A. Scævola Plumieri, Linn 80
B. *Schinus molle*, Linn 63

Page.

Scirpus lacustris, Linn., syn 119
A. melanocarpus, Gr 119
A. plantagineus, Retz 119
A. validus, Vahl 119
A. *Sclerachloa rigida*, Gr 121
SCROPHULARINIÆ 94
B. Scutellaria purpurascens, Swartz 96
C. Sedum acre, Linn 74
C. Selaginella *furcata* 125
C. *Griffithsii*, Spreng 125
C. *hæmatodes*, Kunze 125
C. *inæquifolium*, H. & G 125
C. Martensii, Spreng 125
C. *viticulosa* 125
C. *Wallichii*, H. & G 125
A. Senebiera pinnatifida, DC 48
C. Senecio mikanoides, Otto 85
B. vulgaris, Linn 85
Sequoia gigantea, Torr 109
A. Sesuvium Portulacastrum, Linn 51
C. Setaria glauca, Beauv 121
A. Sicyos angulata, Linn 77
A. Sida carpinifolia, Linn 52
B. Sideritis romana, Linn 96
B. Sisymbrium officinale, Scop 48
Sisyrinchium anceps, Lam., syn 113
alatum, Hook., syn 113
A. Bermudiana, Linn 113
SMILACEAÆ 118
C. Smilax sagittæfolia, Bot. Maj 118
C. Smyrnium olusatrum, Linn 79
SOLANEÆ 91
B. Solanum aculeatissimum, Jacq 96
C. Lycopersicum, Linn 96
A. *nigrum*, Linn 93
A. nodiflorum, Jacq 93
C. ovigerum, Dun 93
A. torvum, Sw 93
C. tuberosum, Linn 93
B. Solidago Mexicana, H. B 84
B. sempervirens, Linn 84
B. virgata, Michx 84
B. *Sonchus asper*, Vill 83
B. *oleraceus*, Linn 83
C. *Sophora Chinensis*, Todd 68
B. tomentosa, Linn 68
C. Sorghum saccharatum, Moench 121
A. Sphagnum palustre .... 12[illegible]
C. Spartium junceum, Linn .... 6[illegible]
A. Spermacoce tenuior, Linn .... 8[illegible]
C. prunifolia, Lieb 72
C. salicifolia, Linn 72
Spiranthes apiculata, Lindl, syn 112
A. brevilabris, Lindl 112
tortilis, Rich, syn 112
A. Sponia Lamarckiana, Don 104
A. Sporobolus elongatus, R. Br., syn 120
A. Indicus, R. Br 120
A. pungens, Kth 120
purgans, syn 120
A. Virginicus, Kth 120
A. Stachytarpheta Jamaicensis, Vahl 96
C. Stapelia maculosa, Jacq 89
A. Statice Caroliniana ? Walt 86
B. *Stellaria media*, Vill 51

Page.
emorum, Linn 51
nneca, var. Cass 84
um Americanum, Schrk 121
    glabrum, Trin 121
floribunda, Pet 89
CEÆ 54
arthaginensis, Cav 54
ellipticum, Spr 49
eginæ, Ait 112
es longicaudatus 90
ritima, Linn 99
ahogoni, Linn 59
IÆ 83
ollissima, H. B 77
an Voxemii, Funk 77
s indica, Linn 66
llica, Linn 110
Dens-leonis, Desf 83
pensis, G. Don 95
ntaphylla, Juss 95
iicans, Juss 95
ns, Juss 95
ACEÆ 62
ciæ, Linn 110
expansa, Ait 110
populnea, Correa 53
eriifolia, Juss 88
rbadensis, Todd 114
gans, Hort, Lind 114
ntea. Nutt 110
ta, Lam 110
midalis, Tenor 109
a, Hook 96
lgaris, Linn 99
.... 54
rucei, Gært 119
osa, C. B. Clarke 79
ifornica, Torr 110
tia gnaphalodes, R. Br 91
    laurifolia, Vent 91
tia discolor, Herit 119
    erecta, Jacq. syn 119
pratense, Linn 64
repens, Linn 64
rifoliata, DC 58
ulgare, Linn 122
althæoides, Lam. syn 54
    lappula, Linn 54
    semitriloba, Linn 54

Page.
TYPHACEÆ 115
A. Typha angustifolia, Linn 115
    Domingensis, Pers ....
UMBELLIFERÆ 79
C. *Ulex europæus*, Linn 63
URTICACEÆ 102
B. Urtica *dioica*, Linn 102
B.   purpurascens, Mitt 102
B.   *urens*, Linn 102
B. Vaillantia hispida, Linn 82
B.   muralis, Linn 82
VALERIANEÆ 82
C. *Vanilla planifolia*, Audr 112
B. Verbascum Thapsus, Linn 95
VERBENACEÆ 96
C. Verbena multifida, R. P 96
B. Veronica agrestis, Linn 94
B.   arvensis, Linn 94
B.   peregrina, Linn 94
C. Viburnum Tinus, Linn 80
C. Vicia sativa, Linn 65
B. *Vigna luteola*, Benth 65
C. Vinca rosea, Linn., var. alba 88
C.   rosea, Linn 88
VIOLACEÆ 50
C. Viola odorata, Linn 50
C.   tricolor, Linn 50
VITACEÆ. See AMPELIDEÆ. 60
C. Vitis vinifera, Linn 60
C. Volkameria aculeata, Linn 97
A. Waltheria americana, Linn 54
C. *Wistaria frutescens*, DC 64
A. Woodwardia Virginica, Willd 123
B. Xanthium echinatum, Murr 86
Xanthoxylum clava-Herculis 56
Youngia lyrata, Cass., syn 83
Yucca *aloifolia*, Linn., syn 116
C.   *filamentosa*, Linn 116
A.   serrulata, Haw 116
C.   *Whippleii*, Torrey 116
A. Xanthoxylum aromaticum, Willd 56
C. Zea mays, Linn 122
C. *Zephyranthes Atamasco*, Herbach 118
C.   rosea, Lindl 118
C. *Zinnia elegans*, Jacq 85
C. Zingiber officinale, Rosc 111
ZINZIBERACEÆ 111
A. Zostera marina, Linn 113
ZYGOPHYLLEÆ 55

PART III.

THE MAMMALS OF BERMUDA.

BY

J. MATTHEW JONES, F. R. S. C.,
OF FERN LODGE, WATERVILLE, NOVA SCOTIA.

THE MAMMALS OF BERMUDA.

Paucity of species, as regards mammalian life on oceanic islands, is a fact well known to all observers; nor can the circumstance create any degree of surprise when we become cognizant of the complete isolation of such positions from any continent, their small area, and recent origin.

The Bermudas present no exception to this general rule, and therefore the present meagre list will not excite astonishment, especially when their peculiar formation and density of population are taken into account.

Order CHEIROPTERA.

Family VESPERTILIONIDÆ.

SCOTOPHILUS NOCTIVAGANS, Lec.

"Silver-haired Bat."

Only one specimen of this Bat is known to have occurred in the Bermudas. It was taken alive near Hamilton on the 8th of October, 1850.

Its geographical range on the North American continent extends, according to Allen,* from the Atlantic coast to the Rocky Mountains, and as far north as the Hudson's Bay Territory.

LASIURUS CINEREUS, Allen.

"Hoary Bat."

According to the observations of my friend, Mr. J. L. Hurdis, of Southampton, England, who passed fourteen years upon the islands in an official capacity, and during that lengthy period was a close observer of the habits of all animals which came under his notice, only two species of Bat are known to visit the Bermudas, and that usually in the autumn and early months of winter. The present species is observed occasionally at dusk during the autumn months hawking about according to its nature in search of insects; but as it is never seen except at that particular season it is clear that it is not a resident, but merely blown across the ocean by those violent northwest gales which also usually bring numbers of birds from the American continent.

---

*Monograph of the Bats of North America. By H. Allen, M. D., asst. surg. U. S. A. p. 41.

The geographical range of this species appears to extend all over the continent of America north of Mexico, extending as far north as Red River Settlement in British North America.

Order CETACEA.

There are two species of Whales now frequenting the sea surrounding the Bermudas, in spring and early summer, and they are doubtless the same which visited the group in the earliest times of which we possess a record. Jourdan* has the first account of Whales being observed there in 1610.

"There are also great plentie whales which I conceive are very easie to be killed for they come so usually and ordinarilie to the shore that wee heard them oftentimes in the night abed and have seen many of them neare the shoare in the day time."

In Smith's "History of Virginia" (1616), we also find mention of Whales at the Bermudas during the months of January, February, and March.

Again, in the "Constitucons and Instructions to Mr. Daniel Tucker now chosen Deputie Gounor for the Somer Islands given by the Gouenor and Companie of the Cittye of London for the said Plantacon" (1616), allusion is made to them.

"As touchinge the whale fishinge we would have you observe that we have sent John Headland our chief harpeneere, Henry Hughes his mate, and others of his ginge (gang) to whose assistance we ioyne Mr. Wilmott as skillful in that buisness, with such others to help as you shall appointe thereto. And that you omitt noe tyme at yor first comminge thither to sett upon that worke, consideringe that the whale fishinge will be soe neare spent before you shall come thither."

It is therefore evident from the foregoing statements that one or more species of these marine mammals regularly visited the islands every spring, and we shall now endeavor to identify those species from the descriptions given by early writers, which are fortunately sufficiently expressive to permit of such determination.

---

* A Plain description of the Barmodas, now called Sommer Ilands, with the manner of their discouerie anno 1609. By Sylvanus Jourdan. London, 1613.

Family BALÆNIDÆ.

EUBALÆNA CISARCTICA, and others.

Common Whale. Right Whale. Cape Whale. Hump-back, &c.

The Right Whale is the only species which may be called a regular migrant to the shores of the Bermudas, and its occurrence there opens up a very interesting source of inquiry as to whether the individuals annually visiting the islands really come from the north and return thither, or merely pass their existence in mid-Atlantic, and resort for some reason to the group with their young during the months of February, March, April, May, and June.

Now, first as to the identification of this species with that so often mentioned by early writers. In the Philosophical Transactions (Royal Society of London) for 1668 appears a communication from Richard Norwood, who was the first person to survey the islands and divide them into shares. It is dated—

"BERMUDA, *June* 18, 1667.

"The killing of whales, it hath been formerly attempted in vain, but within these two or three years, in the spring time and fair weather, they take sometimes one, two, or three in a day. They are less, I hear, than those in Greenland, but more quick and lively; so that if they be struck in deep water they presently make into the deep with such violence that the boat is in danger of being haled down after them if they cut not the rope in time. Therefore they usually strike them in shoal water. They have very good boats for that purpose, manned with six oars, such as they can row forwards or backwards as occasion requireth. They row up gently to the whale, and so he will scarcely shun them, and when the harpineer, standing ready fitted, sees his opportunity, he strikes his harping-iron into the whale about or before the fins rather than towards the tayle. Now, the harping-irons are like those which are usual in England in striking porpoises, but singular good metal, that will not break, but wind, as they say, about a man's hand. To the harping-iron is made fast a strong lythe rope, and into the socket of that iron is put a staff, which, when the whale is struck, comes out of the socket, and so when the whale is something quiet they hale up to him by the rope, and, it may be, strike into him another harping-iron, or lance him with lances in staves till they have killed [illegible] but I have not seen any killed my[illegible]

[illegible] the whale in shoal water proclaims it to [illegible] the sperm whale, which is the only other [illegible] is never known to come near [illegible]

[illegible] of the same species from one Richard Staf[illegible] 1629, and proclaims the identity of [illegible]

[illegible] many sorts of fishes. There is amongst [illegible] whales, which in March, April, and May, use our [illegible] many of them. Their females have abun[illegible] of the teats that grow [illegible] They have no teeth, but feed on moss growing on the [illegible] during these three months, and at no other season [illegible] consumed and gone, the whales go away also. [illegible] their young."

[illegible] whale fishing around the Bermudas appears to have been [illegible] the islanders with more or less success from these early [illegible] present, when, owing probably to the more profitable [illegible] agriculture, which combines at the same time a [illegible] that of the whale fisher, as the [illegible] proved, it is not followed with the same [illegible] characterized the efforts of the early settlers. Neverthe[illegible] almost every year some of these whales are taken; [illegible] were so numerous that no less than twenty were [illegible] the islands. No whales are more commonly [illegible] These are of all sizes, as announcements in the [illegible] following prove:

[illegible] humpback species, a maiden cub of last year, [illegible] morning last (April 22, 1866), by the boats be[illegible] establishment at Port Royal. It was 33 feet [illegible] supposed will produce 40 barrels of oil. [illegible] and then shot at three several times with bomb[illegible] time the third bomb only exploded and [illegible] instant death of the leviathan. This is the first [illegible] has been captured here for some years." Again: "A cub [illegible] 22 feet long was captured by the boats of Port Royal on [illegible] last (April 26, 1871). The old whale followed the young [illegible] the boat with its tail. It was harpooned but broke the warp; it bled freely. It came to the shore the next day, but was not captured. The cub will yield about 5½ barrels of oil."

The adult whales, when struck near shore, often lead their captors a long chase—sometimes as much as 7 or 8 miles out to sea—and even then the warp has to be cut to save the boat. But when taken they amply recompense their lucky captors for their trouble, yielding in some cases from 60 to 70 barrels of oil. When these large whales are towed to shore the vast quantity of blood escaping from their wounds attracts numbers of sharks, some of very large size, which mutilate the body and devour much of the meat. This well-known habit of the sharks is sometimes turned to profitable account by the colored boatmen, who take what is left of the body of a whale, after the process of "flinching" has been gone through, outside the reefs, and let it remain as a bait. Several boats will join in one of these expeditions, having experienced spearsmen on board, who, at every opportunity, spear a large shark which, in its turn, is converted into oil which is of particular commercial value.

There are some curious habits indulged in by this species of whale, known to the islanders, but perhaps none can be accounted so singular and remarkable as that of the animal leaping completely out of water to the height of several feet. A naval officer has placed on record an instance of this extraordinary circumstance as follows: "While we were lying on our oars, in a cutter belonging to the Leander, frigate, in Murray's Anchorage, off Saint George's Island, during the winter of 1802–3, we beheld one of the most extraordinary sights in the world. A whale which had by some means got inside the reef, and was endeavoring to extricate itself from its uncomfortable position, and perhaps provoked at not being able to disentangle itself from the sharp coral reefs, or for some other reason, suddenly made a spring out of the sea. So complete was this enormous leap, that for an instant he was seen fairly up in the air, in a horizontal position, at a distance from the surface, not much short I should think of half his own breadth. His back, therefore, must have been at least twenty feet in perpendicular height over our heads. While in its progress upwards, there really appeared in its spring some touch of the vivacity which belongs to a trout or salmon shooting out of the water. The whale, however, fell back again on the sea, with all the clumsiness imaginable, like a huge log thrown on its broadside; and with such a thundering crash as made all hands stare in astonishment. Total demolition, indeed, must have been the fate of our party had the whale taken his leap one minute sooner, for he would then have fallen plump on the boat. The waves caused by the splash of the monster spread over half the anchorage, nor, if the Leander herself had blown up, could the effect have extended much further."

Scoresby, in his interesting work on the Arctic Whale Fishery, corroborates this curious habit, so that there can be no doubt of its being an indisputable fact.

This whale appears to have been the victim of assault from the Sword-fish (*Xiphias gladius*) and Thresher (*Alopias vulpes*) in days of yore, as as we glean from the pages of an old writer on the Bermudas.*

"I forbeare to speake what a sorte of whales wee have seene hard aboaed the shoare followed sometime by the Sword Fish and the Thresher, the sport whereof was not unpleasant. The sword-fish, with his sharpe and needle finne pricking him into the belly when he would sinke and fall into the sea; and when hee startled vpward from his wounds, the Thresher with his large Fins (like Flayles) beating him aboue water. The example whereof giues vs (saith Ouiedus) to vnderstand, that in the selfe same perile and danger doe men liue in this mortall life, wherein is no certaine security neither in high estate nor low."

And this account is borne out by a further statement to the same effect, made by another eye-witness about the same date.

"Whales there are in great store at that time of the yeare when they come in, which time of their comming is in Februarie and tarry till June. Likewise there commeth in two other fishes with them, but such as the whale had rather bee without there companie; one is called a Sword-fish, the other a Threasher; the sword-fish swimmes vnder the whale and pricketh him vpward; the Threasher keepeth aboue him, and with a mightye great thing like vnto a flayle hee so bangeth the whale, that he will roare as though it thundered, and doth giue him such blowes with his weapon that you would thinke it to be a cracke of great shot."

The Right Whale will sometime become playful with its young, tossing it out of water time after time, and it is a somewhat curious fact that they are more prone to indulge in this pastime during bright moonlight nights, coming close in near the edge of the reefs on the south side of the island and exhibiting their exploits within full view of persons on shore.

---

* "Purchas His Pilgrimes," vol. iv, London, 1625. The ninth book, chap. vi: "A true repertory of the wracke, and redemption of Sir Thomas Gates, Knight; vpon, and from the Islands of the Bermudas: his comming to Virginia, and the estate of that Colonie then. and after, vnder the gouernment of the Lord La Warre, July 15, 10. Written by William Strachy, Esquire."

Some of the larger whales when captured are found to be infested externally by parasites, among others the well-known cirripede (*Balanus*), which, from the large size some of the specimens attain, must have been *in situ* for a considerable period.

The flesh of this whale, especially that of the cub, is often sold for food, and is considered a treat by the families of the fishermen and laborers, who cannot afford to pay the exorbitant prices demanded by the vendors of butchers' meat and poultry. We cannot, however, coincide with the statements of those who declare it impossible to tell a whale-steak from a beef one, when properly cooked, for the oily nature of the substance cannot wholly be obliterated under any circumstances, and never fails to afford the palate of the most ordinary taster a clew to its origin.

The migrations of this whale,* as far as the North Atlantic is concerned, are by no means clearly ascertained, as evinced by the statement made by M. F. Maury, who affirms that "the Right Whale does not cross the equator or reach so low a latitude as Bermuda in the West Atlantic, although it does so on the side of Madeira." A very general belief prevails that the heated waters of the Gulf Stream present an impassable barrier to the southward progress of the Right Whale, and it is somewhat strange that although the presence of this species has been known to the inhabitants of the Bermudas ever since the islands were first colonized, as well as to American whalers for many years, its mode of reaching that position has not been properly investigated. The fact of its crossing the Gulf Stream on its southward migration, and also on its return to the north, has been well known to all traders between northern parts and the West Indies ever since commercial intercourse has been established; but we are unaware of any published statements having appeared to such effect until Col. Drummond Hay, President of the Natural History Society of Perthshire, (Scotland), who was quartered with his regiment, the Forty-second Highlanders, for some years upon the islands, and devoted much of his leisure time in investigating their natural history, in a paper on "Migration," which he recently read before his society, thus alluded to the matter: "One especial instance which I will take is that of the Greenland Whale

---

* Owing to the confusion in local nomenclature so prevalent in Bermuda, the writer has failed to discriminate between the Right Whales and Hump-backs and the Bowhead, which never ranges so far south.—EDITOR.

(*B. mysticetus*), which, with the same regularity as the swallow, comes to Britain, visits the warm seas of the Bermuda Islands, where I have noticed them in large numbers, arriving regularly about the last week of February or beginning of March, and remaining till the beginning of June, and sometimes a little later; those frequenting the shallow waters being the cow-whales with their young, the bulls probably keeping in the deeper waters outside the reefs. While sailing from Bermuda to Nova Scotia, in the month of June, I observed large troops of the blow or true whale, all heading to the north, no doubt on their way from the Bermudas and the warmer seas."

It being, therefore, beyond doubt that the Right Whale does pass through the Gulf Stream on its southern migration to the Bermudas, it becomes an interesting question whether the animal is submitted to a higher degree of temperature while passing through the stream than it is while inhabiting the waters of Bermuda, in which it passes some four months of its existence regularly every year. We are fortunately able to give reliable information upon this subject, having during several voyages between Halifax and the Bermudas (which route, being almost direct north and south, is that traversed by the whales), at different seasons of the year, had excellent opportunities, through the kindness of the commanders of the royal mail steam packets, who are in the habit of taking observations every four hours, of ascertaining the temperature of the Gulf Stream at various positions, and we find that scarcely any difference exists in its temperature as far as regards the months of February and June, the known periods of migration, and that the highest degree of heat of the stream at those periods yet recorded has never exceeded 73°. We have next to look at the temperature of the sea immediately around the Bermudas during the months of February and March, when the whales arrive, and we find that it is generally about 64°, and that of June, when they depart, about 74°; so that it is clear these animals are submitted to a higher degree of temperature for a month or more in the locality they have chosen for a winter resort, than they are during their passage through that supposed impassable barrier of heat, the Gulf Stream. Indeed, it may be said that this whale is capable of bearing a much higher degree of temperature, for in some seasons the maximum of surface temperature at Bermuda during the month of June has reached 78°, so that all statements hitherto made to the effect that the Right or Greenland Whale is unfitted to resist the presence of heat must be considered as wholly incorrect.

It is more than probable that this whale rarely proceeds farther south in the West Atlantic than the latitude of the Bermudas, and that it possibly visits those islands merely for the purpose of bringing forth its young; a theory not unsupported by fact, when we find that the majority of whales taken consist of females and cubs.

Family PHYSETERIDÆ.

PHYSETER MACROCEPHALUS, L.

Sperm Whale; Spermaceti Whale; Trompe Whale.

This species can hardly be considered as more than a casual visitant to Bermudian waters, for it is only at intervals of a few years that the islanders have the good fortune to capture one.

The first authentic account we have of this species being found at the Bermudas is in the "Constitucons and Instructions to Mr. Daniel Tucker now chosen Deputie Gounor for the Somer Islands given by the Gouenor and Companie of the Cittye of London for the said Plantacon" (Date 1616).

"Theise kind of whales we understand by theire description wch have seen them are called Trompe Whales, at whose places of resort there is ever found greate store of Ambergreece, the oyle will be as hard as tallowe, when yt is made, but yet very good for many uses, lett yt be carefully casked up by ytself, without any other whale oyle of other kinds to be mixed with it. Also that kind of whale yieldeth great store of Spermacety wch lyeth in the head, lett that also be carefully reserved by ytself, and put into Caske marked for Spermaceti whither yt be thin or thicke, we will trye it and refine yt when yt shall come hither and doe well observe that puttinge up the oyle the coopers may make the caske very tight, for leakedge by putting Bullrushes into the ioynts, for wch vse we have sent hence store by theise shipps.

"Those Trompe Whales are observed to have noe fins in their throats as some other small whales have, but they have in some of theire inward pts great store of Ambergreece congealed, wch they have not as yet cast out, we pray that you have a care that when any whale is opened you would yourselfe attend or cause some other to see yt searched thoroughly, that neither by negligence or fraud we may be deprived of that hope."

Of late years very few have been taken. One in May, 1863, of the goodly length of 47 feet was captured, and again on June 19, 1869, another was struck, about 14 miles to the south of David's Head, of th length of 40 feet. One boat alone attacked this whale, and after som difficulty the crew succeeded in killing it and towed it the whole wa to Saint George's Whale House, a feat which occupied no less than se enteen hours. It was followed by a large number of sharks, which cut considerably. This whale appears to dislike the shallow waters with soundings, and therefore has to be sought for almost out of sight land. Some are captured off the islands occasionally by passing Am ican whalers. Ambergris, the well-known product of this species, alluded to in the very earliest accounts of the islands.

In the commission of Governor Moore, granted to him by the B muda Company on his entering upon his official duties in the year 161 we find the following:

"Forasmuch as we cannot expect any greate returne of comoditi by this shipp, by reason of her short staye yet we advise and pray y to be as pruident as you may, to send us some fruits of your labors give encouragement to the adventurers, to make the more speedie a better supplie vnto you, especially of Ambergreece wch wee doubt n but you shall finde readye gathered by those three who were left by th last shipp, or ells by the industrye of suche of yo'r own companie you shall employe to seek for yt, for whose better encouragement w are contented to allowe for everye once (Troye weight) that you sha receaue from any of them, the some of thirteene shillinges fowre penc but yf you shall finde any man to goe about to conceale yt and appr priate yt to his owne prticuler use, then you are to seaze upon yt, a you forfeite to the vndertakers, and inflict such other punishment upo the offenders as the qualitie of these offences shall deserve."

In the Laws of the Bermuda Company enacted in 1622, we find a pr tective clause concerning this commodity:

"There is likewise and shall be forever reserved to the Company fifth part of all the Ambergreece that shall be found; and the rest sha be divided equally betweene the finder and the owner of the land whe the same is found; save that three shillings four pence upon every oun of the said Ambergreece shall be allowed to the Governour of the sa Islands. And whosoever shall not discover to the said Governour a Sheriffe and some one other of the Councell, the true quantity of th Ambergreece so found, within five days after the finding of the sam shall forfeit his owne intire part to the Company, and be subject to su other punishment as the Generall Court shall award."

Again in "Domestic Correspondence," Jac. I, vol. lxxiv, No. 89, allusion is made to it in a communication from one John Chamberlain to the Right Hon. Sir Dudley Carleton, Kt:

"OCT. 27, 1613.

"From the Bermudas or Sommer-ylauds there hath come great store of Ambergreece this yeare, w^{ch} is the only commoditie they have thence as yet, but they hope for more hereafter of many kindes, though nothing so rich, and begin to nestle and plant there very handsomely, whereat the Spaniard is nothing pleased but threatens the next yeare to remove them, which advertisement they have by goode meanes and many wayes, but they seeme nothing dismayed therewith, trusting rather to the difficultie of accesse, than to any other strength of theyre owne; the greatest peece of amber in one lump that hath bin heard of was found there this yeare being as bigge as the body of a giant, and aunswerable or resembling almost in all points sauing for the want of the heade and one arme; but they handled the matter so foolishly that they brake yt in peeces, and the biggest they brought home was not above 168 ounces w^{ch} sells better by twelve or fifteen shillings in an ounce than that w^{ch} is smaller."

That it was considered at that time to be of particular commercial value we glean from the following threatened punishment to be inflicted on those who dared to buy or sell it on the islands (Date, 1616):

"No Marryner Sayler or any else of what quality or grade so eue^{r} belonging to any shippe or shipps nowe here resident or who hereafter shall arrive, may bargayne buy trucke or trade with any member of this Plantacon, man woman or childe for Ambergreece of what quantity so eue^{r}, nor for any Ambergreece shall exchange any their provisions whether Butter Cheese Bisket Meale Aquavitoe Oyle any kind of frute or spice or any other prouisions of what qualitie so eue^{r} at any tyme or soe long as they shall here remayne from the date of their presents upon payne to lose the Ambergreece soe bought or trucked for, and losse of their wages in England with corporale punishm^{te} here to be inflicted upon them, and what so eue^{r} pson or psons belonging unto any such shipp or shipps receeve or take any the said Ambergreece of or from any pson or psons members of this plantacon privately take the same unto England upon the same p. ill. Nor shall any pson or psons whatsoeu^{r} of what degree or qualitie soeu^{r} of their Island dare to sell any Ambergreece or the same to trucke exchange or give awaye vnto any such for money or such aforesaide prouisions or otherwise to be as aforesaide upon p. ill to lye in Irons 48 hours wth addicon of such other severe punishm^{ts} as shalbe inflicted upon them. And what soeu^{r} peon or peons that shall at any tyme fynde any Ambergreece and not within the space of tenne dayes bringe or sende the same to the Gouerno^{r} or give notice thereof vnto him where he or thay shall receive content after the rate of the moitie of the halfe the Ambergreece eu^{r}y ounce shall not only lose the profit for finding thereof But also undergoe the aforesaid punishment with severity of Justice w^{ch} in that case shall surely be executed."

The weight of the several pieces of ambergris found at different times since the islands were settled appears to have varied greatly. In 1611 one is recorded of the enormous bulk of 80 pounds; in 1620, one of eight ounces; in 1625, one of nine ounces; in 1626, one of 2 ounces, and another the same year of 19½ ounces. Of late years it appears to have been rarely found.

Order INSECTIVORA.

Family SORICIDÆ.

SOREX ———?

During one of our first visits to the islands several years ago we captured what we believed to be a member of this family, but the specimen was unfortunately lost. During our last visit, in the winter of 1876–77, we gave chase to what we were almost positive was a specimen, running on the side of a by-road in Devonshire parish, but it proved too nimble and escaped. The peculiar dark velvety look of the fur and the small size of the animal was quite sufficient to distinguish it from a common mouse. We have, moreover, received the testimony of reliable persons as to a mouse of this description being occasionally caught, so we think it admissible to register the unknown under its generic name.

Order RODENTIA.

Family MURIDÆ.

MUS DECUMANUS, Pallas.

"Norway Rat"; "Brown Rat."

Mus decumanus, Pallas, Glires, 1778, 91.—Schreber, Säugt. IV, 645; tab. clxxviii.—Keyserling und Blasius, Eur. Wirb. I, 1842, 36.—De Kay, N. Y. Zool. I, 1842, 80.—Wagner, Suppl. Schreb. III, 1843, i.—Burmeister, Thiere Brasiliens, I, 1854, 152.—Aud. and Bach, N. Am. Quad. II, 1851, 22, pl. liv.

Mus norvegicus, Erxleben, Syst. An. I, 1776, 381.

The introduction of rats upon an oceanic island at a period anterior to its occupation by man can only be due to the arrival, or destruction, of a vessel containing such animals upon its shores; and in the case of the Bermudas, which are known to have been the last resting place of many a craft long before they came into the possession of the English, there can be no doubt as to the means by which they obtained a footing upon those isles, so far distant from the nearest land.

As the Norway Rat, which it appears belonged originally to the warmer regions of Central Asia, was introduced into the western countries of Europe so late as the middle of the eighteenth century,[*] it clearly could not have been the species that overrun the Bermudas, according to Smith, more than a century before.[†] Most probably it came to the islands in some of the vessels sent out by the Bermuda Company from England laden with stores for the colonists, about the end of the eighteenth century.

In some of the older houses, especially near the sea, this rat is very troublesome, consuming almost every article it can find, even to the bedclothes of the occupants as they lie asleep, and instances are recorded where children have been seriously bitten during repose at night. This rat is also common in the marshes, where it swims and dives with facility. The old and full-grown specimens are called "beagles" by the islanders.

MUS RATTUS, L.

"*Black Rat.*"

Mus rattus, Lin. Syst. Nat. I, 1766.—De Kay, N. Y. Zool. I, 1842, 79.—Aud. and Bach. N. Amer. Quad. I, 1849, 189, pl. xxiii.—Giebel, Säught. 1855, 555.
Mus americanus, De Kay, N. Y. Zool. I, 1842, 81, pl. xxi, f. 2.
Mus nigricans, Raf. Am. Month. Mag. III, 1818, 446.

This species, which was once so abundant all over Europe and North America, and probably equally so before the introduction of the common house-rat into the Bermudas, is now so scarce that it may be almost said to be extinct.

MUS TECTORUM, Savi.

"*Tree Rat.*"

Mus tectorum, Savi. "Nuovi Giornale di Lett. 1825."—Bonaparte, Fauna Italica, plate.—Keys & Blasius, Europ. Wirb. 1842, 36.—Wagner, Suppl. Schreb. III, 1843, 405.—Burmeister, Thiere Brasiliens, I, 1854, 154.—Giebel, Zoologie, 1855, 555.
Mus alexandrinus, "Geoffr. Desc. de l'Egypte."
Mus flaviventris, "Licht. Brants Minzen, 108."

---

[*] Baird, Mammals of North America, p. 439.

[†] Smith, History of Virginia, p. 137.

Mus infuscatus, "Wagner, Suppl. Schreb. III, 1843, 445."
Mus setosus, "Lund, Bras. Dyr."
? *Mus rattus*, var. Aud. & Bach. N. Amer. Quad. I, 1849, 191, 194, pl. xxiii.
Mus americanus, "Lebr., Thes. II, 30; tab. xxix."—Ersleben, Syst. An. I, 1776, 385.—
Leconte, Pr. A. N. Sc. Phil. VI, 1853, 414.
Rat d'Amerique, "Brisson, Reg. An. I, 172."

The earliest account of this rat, as inhabiting the Bermudas, is about the year 1615 when, from the following instructions sent out by the Bermuda Company in London to Governor Tucker, we infer that it existed there:

"Wee have sent you yellow ratsbane in fyne powder to kill ratts to be mixed with oatemeale and laid in shells on the ground wesoever they haunt, wch lett not be neglected nor any other meanes to traps snares and whatsoever ellse to sestroye them utterlye yf yt be possible least they mutliplie upon you and devour all yor fruits and plants."

In Capt. John Smith's History of Virginia it is stated that in the year 1618 a vessel laden with grain was wrecked on the reefs, and that numbers of rats escaped from her and landed on the islands to the great detriment of the plantation. The account is as follows:

"But the great God of heaven being angry, caused such an increase of silly rats in the space of two years so to abound, before they regarded them, that they filled not onely those places where they first were landed, but swimming from place to place, spread themselves into all parts of the countrey, insomuch that there was no iland but it was pestered with them; and some fishes have been taken with rats in their bellies, which they caught in swimming from ile to ile; their nests had almost in every tree, and in most places their burrowes in the ground like conies: they spared not the fruits of the plants, or trees, nor the very plants themselves, but ate them up. When they had set their corne, the rats would come by troupes in the night and scratch it out of the ground. If by diligent watch any escaped till it came to earing, it should then very hardly escape them; and they became noysome even to the very persons of men. They vsed all the diligence they could for the destroying of them, nourishing cats both wilde and tame, for that purpose: they vsed ratsbane, and many times set fire on the woods that oft run half a mile before it was extinct euery man was enioyned to set twelve traps, and some of their own accord have set neare an hundred, which they euer visited twice or thrice in a night; they also trained up their dogges to hunt them, wherein they became so expert that a good [illegible] two or three hours would kill forty or fifty. Many other devices they used to destroy them, but could not prevaile, finding them still increasing against them; nay they so devoured the fruits of the earth that they were destitute of bread for a yeare or two; so that when they had it afterwards, they were so wained from it, they easily neglected to eat it with their meat. Besides, they endeauoured so much for the planting tobacco for present gaine, that they neglected many things might more have prevailed for their good, which caused amongst them much weakness and mortality, since the beginning of this vermine.

"At last it pleased God, but by what meanes it is not well known, to take them away; in so much that the wilde cats and many dogs that lived on them were famished, and many of them leaving the woods came down to their homes, and to such places where they use to garbish their fish, and became tame. Some have attributed the destruction of them to the increase of wild cats, but that is not likely they should be so suddenly increased rather at that time, than four years before; and the chief occasion of this supposition was because they saw some companies of them leave the woods, and slew themselves for want of food; others by the coldnesse of winter which notwithstanding is neuer so great there, as with us in March, except it be in the wind; besides the rats wanted not the feathers of young birds and chickens which they daily killed, and Palmetto mosse to builde themselves warm nests out of the wind; as usually they did; neither doth it appeare that the cold was so mortal to them, seeing they would ordinarily swimme from place to place, and bee very fat even in the midst of winter. It remaineth then, that as God doth sometimes effect his will without subordinate and secondary causes, so we need not doubt, but that in the speedy increase of this vermine, as also by the preservation of so many of them by such weake meanes as they then enioyed, and especially in the so sudden remoual of this great annoyance, there was ioyned with and besides the ordinary and manifest meanes, a more mediate and secret work of God."

From this description it is evident that the amazing horde of rats which overran the islands at this early date were tree rats which at the present day usually construct their nests in trees, as they appear to have done two centuries and a half ago. But the question may arise, how could so vast a horde suddenly, as it were, come into being, for if we are to place any confidence in the accounts given by Jourdan not a rat was to be seen some five years previous. It certainly appears somewhat mysterious, and we cannot but think that rats existed on the islands many years before the wreck of Sir George Somers' vessel, which is s graphically described in the work referred to. And it is, moreover, ver probable that the tree or roof rat, which was an Old World species origi ally from Egypt and Nubia, from which it was taken to Italy and Spain, was introduced into the Bermudas by the several wrecks of Spanish ves sels which during the sixteenth century were evidently cast upon them Many of these vessels were possibly cast away on the western reefs, a are most of the vessels voyaging from the West Indies to Europe at th present day. In this case the rats would have landed on the shores o Somerset parish, which face these reefs, and finding ample food for som years for their wants, would have had no occasion to migrate to othe parts of the group. But after a lapse of a few years, taking into con sideration the fecundity of the race in a genial climate, and the absenc of all enemies, their numbers would increase so prodigiously that al available food would be consumed and a migration rendered absolutel necessary. Thus would occur the sudden invasion made upon the crop and stores of the early settlers who were established at the east end o the islands, for by the natural instinct granted to all animals, the posi tion of food in plenty would soon be discovered, especially by thes starving creatures.

The tree rat is very fond of fruits, and will climb up and do great dam age, especially to crops of oranges. We have reason to believe that i is this species which is also so destructive to the root crop. In commo with the brown rat, they will frequent stables for the purpose of pro curing the oats or Indian corn given to the horses, but while the lat ter species generally makes its exit when surprised by holes in th floor, the former takes to the roof and escapes by the opening unde the eaves. It builds its nests either in the dilapidated roofs of ol houses or outhouses, or in trees. In the latter case it chooses variou positions, but generally one which enables it to rest secure from th effects of the heavy gales of wind which are of frequent occurrenc We have found them as high as 20 feet from the ground, situate in a angle formed by the bole of an aged cedar and a lateral branch of th same; also within a few feet of the ground, in the fork of a branch cedar. Again, in a low bush in a swamp, a few feet above the stagna water. The nests which occur in the cedars are composed entirely the bark of the same trees, called "bass" by the islanders; the lon coarse strips outside, while within, the substance gets finer and fine

---

* Baird, Mammals of North America.

In other situations, as the shrub we have mentioned, the nest is composed outwardly of leaves of that shrub, with softer vegetable material within. In most cases the nest is generally spherical and about a foot in diameter. Whenever we have surprised the tenants of these nests unawares, we have always observed the young, about half or three parts grown, escape, but no old ones.

It was not until the year 1872 that we were enabled, through the kindness of Prof. S. F. Baird, satisfactorily to identify the species, as in common with the native inhabitants, we had always considered it as merely a variety of the brown rat; but in that year, having secured two half-grown young from a nest, and perceiving a marked difference in the color, especially of the under parts, we forwarded one to the Smithsonian Institution for Professor Baird's opinion, who at once recognized it as the white-bellied or roof rat of the Southern States.

MUS MUSCULUS, L.

Common Mouse.

The common mouse is very abundant throughout the islands, but more especially so where surrounding circumstances favor its support and increase. In all dwellings and their outhouses it is to be found; but usually where rats are numerous the mice are scarce; for there is no doubt that the smaller members of the tribe suffer greatly from the continued attacks of the larger ones. They are particularly numerous about planting land, and do much damage to the root crops, as well as to the Indian corn. We have observed them even in the center of the marshes where the ground was more or less covered by water, at the roots of the tall sedges, making their way over the prostrate stems. It can swim well when occasion requires, and has no doubt by this means introduced itself into many situations where its occurrence could not otherwise be satisfactorily accounted for. We have been informed that light-colored mice have been seen in different places, which the observers have supposed to differ from the common species; but our own investigations, which have extended over several years in almost every part of the group, do not allow us to concur in the supposition.

As a somewhat curious circumstance we may state that the common domestic fowl of the island will sometimes seize a mouse and eat it.

PART IV.

THE BIRDS OF BERMUDA.

BY

Capt. SAVILE G. REID, F. Z. S.,

OF THE ROYAL ENGINEERS, MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION, &C.

THE BIRDS OF BERMUDA.

INTRODUCTION.

It was with considerable diffidence, notwithstanding the very flattering nature of the invitation sent to me, that I consented to appear a a third time in print on the avi-fauna of the Bermudas, and I trust that a knowledge of this fact may go far to excuse my presumption in ranging myself among the learned professors and men of science who contribute to this work, and also the numerous short-comings in my particular department. I was puzzled for a long time how to begin my task, finally deciding to present, as a brief history of the Birds of the Bermudas, my original notes published in the "Field" newspaper in 1875, and in the "Zoologist" in 1877, thoroughly revised and brought up to date, with the addition of the synonymy and measurements of each species taken from the highest American and European authorities.

I fear a long introduction will be considered out of place in a work like this, but, as it may possibly prove of interest to any naturalist contemplating a visit to the islands, I have ventured to rewrite a large portion of my original preface, as follows:

In March, 1874, when ordered to the Bermudas to complete my tour of foreign service, I made diligent and most anxious inquiries about the birds likely to be found there, and I must say the answers I got from brother officers and others who were familiar with the islands were anything but satisfactory in an ornithological point of view. I was informed that birds were few and far between, with the exception of one or two common resident species, and a casual flock of plovers or waders in the autumn months. My ardor cooled to zero abruptly. I looked forward to the red, blue, black, and white birds of my informants, and the uncertain and erratic Plover, with a sigh of despair! Should I take a gun at all, to lie idle in the damp corrosive climate to which I was bound?

However, on board the good ship Severn—a hired transport, which conveyed the company of Royal Engineers, to which I then belonged, across the Atlantic—I found some officers of H. M. Fifty-third Regiment

Captain
ome birds
e sea." His
more species,
and "Snipe." I
snug and safe in
called upon.
in Bermuda till March
newhat limited powers of
ext day—our first on shore—
time till June 3, 1875, when I left

north, and longitude 64° 51′ west, 600
great North American continent, and exposed
varying gales, the long, narrow group of islands
Bermudas" offer a harbor of refuge to many a weary,
migrant on its passage north or south, and in consequence
great many genera of the North American avi-fauna repre-
the visiting list. On this subject my friend, Mr. J. Matthew
of the Middle Temple, editor of "The Naturalist in Bermuda"
remarks: "That the Bermudas afford an excellent position from
to observe the annual migration of many species of the feathered
of America cannot be doubted. Equidistant, or nearly so, from
the shores of Nova Scotia, the United States, and the West Indian
archipelago, they present, as it were, a casual resting-place to many
birds while traversing the broad expanse of ocean which forms the
eastern limit of their great line of flight."

Some species, as the American Golden Plover, American Snipe, Sora Rail, Night Hawk, Yellowshanks, &c., seldom fail to appear every autumn, and may be set down as regular visitors, probably from the fact that their line of migration is direct from the northeastern coasts of the continent to the West Indies and tropical South America; but, as will presently be seen, the great bulk of the recorded species are irregular or accidental visitors, whose migratory journeys are less ambitious, and who are blown off the mainland by unfavorable winds. That fresh species will from time to time be added to the present list is more than probable; in fact, it is *possible* that the whole migratory avi-fauna of North America may eventually be recorded as Bermudian. When such diminutive flyers as the Ruby-throated Humming-bird, ***Trochilus colu***

the Blue Yellow-backed Warbler, *Parula americana*, can find
ross 600 miles of water in safety, where is the line to be

tion of a solitary example of the European Skylark,
two of the European Snipe, *Gallinago media*, the
ded in the Bermuda list are included in that of
ecies has as yet been discovered peculiar to
ept the theory of the comparatively recent
ne group, is not to be wondered at. At one
great hopes of establishing a real 'Mudian species,
nes observed a small brown bird, remarkably shy and
in its habits, among the dense rushes and scrub of the larger
ps, and this I could not refer to any known North American form.
I had a good view of one, too, close to me, one Sunday afternoon (*of course* it was a Sunday, when I had no gun with me), and carefully took stock of the little fellow; but as I never succeeded in procuring a specimen, I must perforce leave the question undecided, in the hope that some one may be more fortunate in this respect than myself.

Rejecting doubtful occurrences, one hundred and eighty-one species are known to have occurred in the Bermudas up to June 3, 1875. Since then five more have been added, making a total of one hundred and eighty-six species entitled to a place in the list of Bermudian birds. During the fourteen months I resided there, no less than seventy-nine species were recorded, sixty-eight of these by myself personally. I was only able to obtain specimens of sixty-one of these, but that, of course, far exceeded my original expectations. The winter of 1874–'75 was not exactly a favorable one for a collector, few violent storms occurring at critical times to drive the birds to the strange and unexpected shelter in mid-ocean. I worked hard—as hard, that is to say, as my multifarious duties as an engineer officer would permit—but many things are against the study of ornithology in the Bermudas. In the first place, the peculiar elongated shape of the group of islands, and the long distances between the various swamps and "likely" places, to say nothing of the indifferent character of the roads, render it no easy task to "register" even a particular district in the course of an afternoon. The climate, too, except when the wind is from the north in winter time, is warm and damp, and much against a long struggle through the sage bush and scrubby cedars which clothe the hills, or over the rough, steel-pointed rocks of the shore. Then there is such an extent of cedar forest, dotted here and there with patches of highly-cultivated garden, that it is hard to find birds, or, when found, to follow them up. Mosquitoes are frightfully large and ferocious in summer and autumn, especially in and around the ponds and swamps. Many a time have I lost a long-expected shot by having to brush the little torments in dozens from my nose and eyes. And as to believing a word the good-natured colored people tell you about the extraordinary birds they see, it is simply impossible.

But, in spite of these drawbacks, I enjoyed my ornithological labors vastly, and look back with pleasure not only to the successful stalk or lucky snap-shot which occasionally rewarded my exertions, but also to the numerous instructive hours I passed, field-glass in hand, in the deepest recesses of the swamps or on the open shore, watching the agile *Mniotilta varia* and the comical *Totanus solitarius*, or listening to the loud musical "chip" of *Seiurus noveboracensis*, and the harsh, grating cry of the Phaëtons.

In the following notes I have largely availed myself of those of Colonel Wedderburn (late Forty-second Highlanders) and Mr. Hurdis (formerly controller of customs in the islands), which have already been given to the public in a little work, entitled "The Naturalist in Bermuda," to which I have before alluded; also of the collection of birds formed, during the last twenty-five years, by Mr. Bartram, of Stocks Point, near St. George's. I trust I may be held excused for the constant references to these sources of information, both by the gentlemen named and by the indulgent ornithological reader. Colonel Wedderburn and Mr. Hurdis compiled their valuable notes long before my time, as may be inferred from the date of the book mentioned (1859); and since their departure no one, except my friend Mr. J. M. Jones, appears to have kept any record of the bird-life of the islands—more's the pity. With Mr. Bartram, now an elderly man, I struck up a great friendship, and I spent many an afternoon poring over his birds. He has about one hundred and twelve species, all collected and set up by himself, and a carefully kept note-book relating to their capture. His collection is the only one of any note in the islands and contains numerous unique examples of rare stragglers. An old soldier, settling at the expiration of his service on the picturesque promontory of Stocks Point, where he still resides, Mr. Bartram has added the study of natural science to that of farming; and, in addition to producing the best arrow-root in the place, he has a turn at geology, conchology, ornithology, and several other "ologies;" writes on scientific subjects to the local papers; and smokes his pipe in his museum, monarch of all he surveys—a commendable example to the British army.

These, however, are not the only assistants, past or present, that I met with. My friend Colonel Bland, Royal Engineers, an excellent ornithologist, though he was too much engrossed with the cares of the royal engineer's office to accompany me in many of my excursions, helped me much in my identifications, which his knowledge of Canadian forms greatly aided; while Mr. J. M. Jones, besides placing his note-book at my disposal, was always ready with a suggestion or kind word of encouragement. Lieutenant Denison, Royal Engineers, my companion in many a bird-hunt in days gone by, arrived in Bermuda in January, 1875—too late, unfortunately, to take much part in my labors. On him has devolved the task of checking and auditing my accounts, of remedying numerous deficiencies, and of supplying much additional information collected during his eighteen months' residence in Bermuda.

In conclusion I may add that my friend Mr. J. L. Hurdis has kindly sent me his valuable MS. notes on birds made during his long sojourn in the islands; that Mr. Bartram has written me most interesting and graphic letters on recent ornithological occurrences; and that our worthy editor has never for a moment relaxed his energetic co-operation with me in the work I have undertaken.

S. G. P.

DECEMBER, 1878.

ORDER PASSERES.

Sub-order OSCINES.

Family TURDIDÆ.

Sub-family TURDINÆ.

Genus TURDUS, Linn.

1. *Turdus migratorius*, Linn. American Robin; **Red-breasted Thrush.**

Turdus migratorius, Linn., Forst., Vieil., Wils., Bp., Nutt., Aud., and of authors generally.
Merula migratoria, Sw. & Rich.
Turdus canadensis, Briss.

Length, 9.75; wing, 5.43; tail, 4.75; tarsus, 1.75.

Hab.—Continent of North America and portions of Mexico. West Indies rarely. Accidental in Europe. (Coues.)

By no means common, but occasionally arrives singly or in small flocks, both on northward and southward migrations, especially the former. Specimens were obtained in February and March, 1850, and in March, 1855. One was sent to Mr. J. M. Jones on November 24, 1871, when several others were seen. I saw one near Hungry Bay on October 29, 1874. Mr. Bartram obtained one at Stocks Point about the same time, and Lieutenant Denison, Royal Engineers, records one shot in Devonshire Swamp on the 27th November, 1875; these last-named occurrences establishing beyond doubt the autumnal appearance of the species, which had not been recorded in former years. Like many other migrants, the Robin would seem to modify its habits considerably on finding itself in a strange country, and to become shy and retiring in disposition. The bird I saw took up its quarters in a thick mangrove swamp, and remained there, or in some tall thick cedars hard by, for several days. An intelligent colored boy in charge of cattle on an adjoining meadow, who really *does* know how to describe a bird, saw it frequently, and told me it was very wild and hard to get near. This is very unlike the Robin I have met with in Canada and the United States. It is a thousand pities that this fine bird cannot be persuaded to stay and breed in Bermuda, and to add its music to that of the common resident species. Colonel Wedderburn mentions (Nat. in B., p. 27) that a portion of a small flock of unfortunates, which made their appearance in February, 1850, was spared, with the hope that they might be tempted to remain; but they all disappeared in a few weeks' time, not leaving a single straggler.

2. *Turdus mustelinus*, Gm. Wood Thrush.

Turdus mustelinus, Gm., Lath., Vieil., Bp., Nutt., Aud., and of modern authors.
Merula mustelina, Rich.
Turdus melodus, Wils., *Turdus densus*, Bp., *Hylocichla mustelina*, Bd.

Length, 8.10; wing, 4.25; tail, 3.05; tarsus, 1.26.

Hab.—United States, east of Missouri Plains, south to Guatemala, Cuba, Honduras, Bermuda. (B. B. and R.)

Only one appearance of this species is on record, viz, in the autumn of 1849—a season also memorable in Bermuda annals for an extraordinary invasion of Swallows and Cuckoos, which took place throughout the islands. Both Colonel Wedderburn and Mr. Hurdis obtained specimens of this Thrush, but Mr. Bartram was not so fortunate.

3. *Turdus swainsoni*, Cab. Olive-backed Thrush.

Turdus minor, Gm., Vieil., Bp.
Turdus solitarius, Wils. *Merula wilsoni*, Sw. & Rich.
Turdus olivaceus, Gir. *Merula olivacea*, Brewer.
Turdus swainsoni, Cab., and of modern authors.
Turdus minimus, Lafresnaye, Bryant, Lawr.

Length, 7; wing, 4.15; tail, 3.10; tarsus, 1.10.

Hab.—The whole of North America, excepting, perhaps, the southwestern United States, south to Central America, New Granada, Ecuador, and Cuba. Greenland, Europe and Siberia (accidental). (Coues.)

This species also visited Bermuda in small numbers during the productive autumn of 1849, when a few were obtained. It has since occurred, at long intervals, in the autumn. Mr. Bartram's collection contains three specimens of various dates. On April 20, 1875, I shot a fine male in Smith's Marsh, the first recorded instance of its vernal appearance. The stomach contained four or five white grubs, and some fragments of marsh plants. One was brought to Lieutenant Denison, Royal Engineers, on the 22d September, 1875, and another (a male) killed by a boy with a stick in Devonshire Swamp, on the 19th February, 1876.

Sub-family MIMINÆ.

Genus Mimus, Boie.

4. *Mimus carolinensis*, (Linn.) Gray. Cat-bird.

Muscicapa carolinensis, Linn.
Turdus carolinensis, Licht.
Orpheus carolinensis, Aud.
Mimus carolinensis, Gray, Bd., and of modern authors.
Galeoscoptes carolinensis, Cab., Bd., Sumich., Scl., Stev.
Felivox carolinensis, Bp.
Turdus felivox, Vieil., Bp., Nutt., Aud.
Orpheus felivox, Sw. & Rich., Aud.
Mimus felivox, Bp.
Turdus lividus, Wils.

Length, 8.85; wing, 3.65; tail, 4; tarsus, 1.5.

Hab.—United States, north to Red River and Saskatchewan; the Columbia, to Utah, Wyoming, and Colorado; south to Mexico, Cuba. Resident in Southern States (Coues).

Locally termed "Blackbird." Resident and abundant; its mewing cry may be heard all the year round, relieved in spri weak but commendable roundelay. After a shower of rain in June the marshes appear literally alive with these sprightly bi a most agreeable concert takes place among the males, prolo dusk should the weather continue fine. On ordinary occasions spring time they sing a good deal, but rain seems to delight t yond measure. They are at most times remarkably bold birds, low an intruder through the swamp or cedar grove, perching him and scolding most unmusically; but when a pair have a n are far more suspicious, and silently leave the neighborhood home. The hen bird sits very close on her eggs, but when di darts rapidly away, returning as quickly and noiselessly when d past. Nidification commences about the end of March and agai end of May, two broods being reared. The nest is a large clums ure, built of dry grasses, weeds, and twigs, lined with small It is very often ornamented externally with rags, bits of pape ton leaves, &c., according to the quaint fancy of the architec usual site is in a cedar branch or lemon tree, at from three to ei from the ground; but occasionally an ambitious pair will go a higher. Eggs deep blue, with a greenish tinge, .92 in. by .68 in., four in number. Among the numerous nests I examined I foun siderable proportion to contain one egg much shorter and round e other three. In one case this egg was almost a perfect sphere. here being but few grapes or wild fruit grown in Bermuda to attract hese mischievous birds, they are not looked upon with the same disavor as in the United States. Mr. Hurdis mentions two instances of he occurrence of this species in mottled plumage, and I was told of ne being seen, while I was there, with a good deal of white about it.

Family SAXICOLIDÆ.

Genus SAXICOLA, Bechst.

5. *Saxicola œnanthe*, Bechst. Wheatear.

Motacilla œnanthe, Linn.
Saxicola œnanthe, Bechst., and authors generally.
Saxicola œnanthoides, Vig., Cass.

Length, 6; wing, 3.45; tail, 2.50; tarsus, 1.05.

Hab.—An Old World species (Europe, North Africa, and Asia). Abundant in Greenland. Found probably as an autumnal migrant in Labrador, Canada, Nova Scotia, &c. Very occasional in the Eastern States: Long Island. (B. B. & R.)

This bird, a waif and a stray from Europe, via Greenland, to the American continent, has actually found its way to these remote islands. One was shot by an officer of the garrison, near the light-house, on October 5, 1846; the tail, unfortunately, was the only portion preserved, but this was sent to the late Mr. Yarrell, who confirmed its identity. Another was seen frequently by Colonel Drummond and Colonel Wedderburn, near St. George's, in March, 1850, but baffled all their attempts to obtain it. Whether these two examples came direct from Greenland, or were blown off the American coast, is an inscrutable mystery. No others have since been recorded.

Genus SIALIA, Sw.

6. *Sialia sialis* (Linn.) Hald. Eastern Bluebird.

Motacilla sialis, Linn.
Sylvia sialis, Lath., Vieil., Wils.
Saxicola sialis, Bp.
Ampelis sialis, Nutt.
Sialia sialis, Hald. and modern authors.
Sialia wilsoni, Sw., Aud.
Erythaca (*Sialia*) *Wilsoni*, Sw. & Rich.

Length, 6.75; wing, 4.00; tail, 2.90.

Hab.—Eastern faunal area of temperate North America, north to 48°; west to Western Kansas (to Colorado, Holden) and Lower Missouri region; Bermuda, Cuba. (Coues.)

The Bluebird is one of the resident species, and is very common. It is also migratory, arriving in small flocks after heavy gales in the winter months. Colonel Wedderburn observed them in large flocks at Ireland Island on January 5, 1848; and my friend Mr. J. M. Jones records their appearance in smaller bands in the Novembers of 1866 and 1871. I have frequently noticed a sudden increase in the numbers of this species in the winter, but the visitors appear to leave again in the early spring, taking with them doubtless some of their 'Mudian brethren, for no perceptible accession of strength is apparent during the ensuing summer, and, as will presently be seen in a quotation from Mr. Hurdis' notes, so many occasionally take their departure as to cause a perceptible diminution in the numbers of the resident birds.

Mr. Bartram, an excellent authority, inclines to the belief that they do not migrate, but merely collect into flocks for the winter, but with all due deference to him I think the following account by Mr. Hurdis is sufficient to prove their migratory habits in the islands. "Although this beautiful and familiar bird appears to be a permanent resident in the Bermudas, vast flights of them sometimes arrive from the American coast. This was particularly the case as observed by Colonel Wedderburn in the winter months of 1848. In December, 1849, I fell in with a large flock of these birds in Paget Parish. There was an appearance of wildness and vigor about them which convinced me they were strangers. A small party of eight or ten birds of a different species was observed in the midst of these Bluebirds, moving with the flock from place to place. I contrived to get within range of the small party and brought down one specimen, which proved to be a Cedar Waxwing (*A. cedrorum*), in beautiful plumage, but wanting the waxen appendages to the secondaries. It was, consequently, a young bird of that year. Now the Cedar Waxwing is a rare visitant in the Bermudas and is never known to breed there. These Cedar-birds, then, must have arrived recently in these islands, and in all probability had traversed the ocean in company with the flock of Bluebirds they were associating with.

"There is reason to believe that numbers of the native Bluebirds leave the Bermudas with these large migratory flocks, thereby causing, as in the summer of 1851, a comparative scarcity of that bird; indeed, but for this supposed movement, it would be difficult to account for the annual increase of the native birds.

This is, to my mind, the most delightful of birds, and certainly the flower of the limited flock of Bermuda residents; its brilliant plumage, vivacious manners, and pleasant warble render it an object of interest to all; while its confiding and fearless nature in the breeding season, and the number of noxious insects it destroys, cause it to be strictly protected throughout the islands. The male bird in spring, when the sun's rays illumine his dazzling blue plumage, is perfectly lovely; he flashes across the road like a ray of azure light, and seems actually to blaze with intense color from among the sombre foliage of the cedars. His spouse is far more sober in her attire; but she too puts on nuptial attire and looks uncommonly smart in April and May, when she acquires an unusually vivid blue, and much suffusion of reddish brown about the head. I accidentally shot one in this plumage one afternoon, thinking it was a stranger, so much did it differ from the ordinary female. They breed twice, and, I believe, in some cases thrice; I have seen fresh eggs on April 4, and as late as June 19. Eggs four or five, delicate pale blue, unspotted, .85 inch by .68 inch. Nest of grasses and bents, in all manner of places. I have found them commonly in holes in old quarries or road-side cuttings; also in crevices of walls; in rocks, even when some little distance from the shore; in holes in trees; on the branches of trees; in stove and water-pipes; in calabashes, boxes, &c., hung up for them in the verandas of houses; in the folds of a canvas awning outside the door of one of the officers' quarters at Prospect Camp; and in several other curious situations. The female sits close, and I have caught her on the nest. The young are strikingly spotted until their first molt. The males sing much in the early morning in spring, both stationary and on the wing, and continue their song, though with diminished ardor, till an hour or so before sunset. A warm, sunny day in winter, however, is the time to hear them in perfection, when a favorite cedar grove will resound with their combined melody, each songster perched on the very topmost twig of a tall cedar. The song is merely a short, but sweet, wild little stave, sounding to me not unlike that of the Blue Thrush (*Monticola cyaneus*), as I used to hear it from the heights, far away above my head, on the rock of Gibraltar. The call-note is a soft twitter; but they have also a loud double note, "cher-wee," reminding one forcibly of that of an *Ægialitis*. Attempts are made frequently to bring up young birds from the nest, but they rarely succeed. A few live ones are to be seen in captivity, presumably adults captured by birdlime or in traps; but as a cage bird it is a failure. It occasionally drives the Red Bird (*Cardinalis virginianus*) from its nest, even after eggs have been laid, and uses it as a foundation for its own.

This is somewhat extraordinary, when one considers the formidable bill of the victim; but the Blue Bird is a determined little fellow, and fortune favors the bold. A great number of "crawlers"—long scaly grubs, with no end of legs—are destroyed by these useful birds, who will sit patiently watching for them on a convenient twig, swooping down on the first comer and bearing him off in triumph. They will also dart into the air after passing insects much like a Flycatcher, returning each time to their starting-point. They are very bold in pursuit of prey when they have young to feed, but always visit their nest with extreme caution should an observer be near.

Family PARIDÆ.

Sub-family SITTINÆ.

Genus SITTA, Linn.

7. *Sitta canadensis*, Linn. Red-bellied Nuthatch.

Sitta canadensis, Linn., Gm., Lath., Bp., Nutt., Aud., Bd., and other modern authors.
Sitta varia, Wils.
"*Sitta stulta Vieill.*", (Bp.)

Length, about 4½ inches; wing, 2⅝.

Hab.—North America, at large in wooded regions, but rather northerly (to 66° or farther); south, however, to the Mexican border. (Coues.)

One specimen only has been taken in Bermuda; this is in Mr. Bartram's collection, and was shot by himself near his house at Stocks Point.

Family CERTHIADÆ.

Sub-family CERTHIINÆ.

Genus CERTHIA, Linn.

8. *Certhia familiaris*, Linn. Brown Creeper.

Certhia familiaris, Linn. and of authors—Vieil., Wils., Aud., &c.
Certhia americana, Bp., Nutt., Bd., &c., and nearly all local writers of eastern United States.
Certhia mexicana, Gloger and Reich., &c. (A variety.)

Length, 5.50; wing, 2.60; tail, 2.90.

Hab.—Europe, North America at large, Mexico (var.). (Coues.)

Certhia familiaris, Brown Creeper.—A male bird of this species was shot by Bendall, an old soldier of the Fifty-third regiment, out of three or four seen in Devonshire Swamp, on November 24, 1876.

Family MOTACILLIDÆ.

Sub-family ANTHINÆ.

Genus ANTHUS, Bechst.

9. *Anthus ludovicianus*, (Gm.) Licht. American Pipit.

Alauda ludoviciana, Gm., Lath.
Anthus ludovicianus, Licht., Bp., Aud., Giraud, and modern authors.
Alauda rubra, Gm.
Anthus rebens, Merr.
Alauda pennsylvanica, Briss.
Anthus pennsylvanicus, "Zander". (Naum.)
Alauda rufa, Wils.
Anthus spinoletta, Bp., Nutt., Aud.
Anthus aquaticus, Sw. & Rich., Aud.
Anthus pipicus, Aud., Bp.
Anthus reinhardtii, Holböll.
Anthus hypogæus, Bp.

Length, 6.50; wing, 3.45; tail, 2.95.

Hab.—Whole of North America; Mexico; Guatemala; Bermuda; Greenland; accidental in Europe. (Coues.)

Anthus ludovicianus, Brown Lark; Pipit.—Colonel Wedderburn has a specimen in his possession, shot by Mr. Fozard on November 26, 1848. There are two others in Mr. Bartram's collection, shot by himself near St. George's.

Family ALAUDIDÆ.

Sub-family ALAUDINÆ.

Genus OTOCORYS, Bp.

10. *Otocorys alpestris*, Bp. Shore Lark, Horned Lark.

Alauda alpestris, Forster., Linn., Gm., Lath., Wils., Bp., Nutt., Aud., and of earlier authors generally.
Eremophila alpestris, Boie.
Phileremos alpestris, Brehm., Bp., Keys. & Blas.
Otocorys alpestris, Bp., Gray, Cab.
Alauda cornuta, Wils., Sw. & Rich.
Eremophila cornuta, Boie, Bd., and recent American authors.
Phileremos cornutus, Bp.
Otocorys cornuta, Cab.

Length, 7.75; wing, 4.50; tail, 3.25; bill above, .52. (Bd.)

Hab.—Everywhere on the prairies and desert plains of North America; Atlantic States in winter; Bermuda; Europe; Asia.

Obs.—Var. *chrysolæma*, from southwest Territories of North America and southward to New Granada. Var. *leucolæma* resident on the dry interior plains from Iowa and Minnesota westward.

Three examples are recorded by Colonel Wedderburn: two at St. George's, October 25, 1849, and one at Spanish Point, February 27, 1850. In Mr. Bartram's collection are three specimens. I shot a fine male on the north shore, close to the old lunatic asylum, on January 29, 1875. It fell into the sea, in the middle of a huge mass of gulf weed, through which I had to swim some distance for it. Fortunately, I was not observed, or I might have found myself an inmate of the adjacent building. Lieutenant Denison, Royal Engineers, obtained two specimens, after my departure, in January, 1876.

Genus ALAUDA, Linn.

11. *Alauda arvensis*, Linn. **European Skylark.**

Alauda arvensis, Linn.
Alauda italica, Gm.
Alauda vulgaris, Leach.
Alauda montana, Brehm.
Alauda cantarella, Bp.
Alauda dulcivox, Hodgs.
Alauda japonica, pekinensis, intermedia, Swinhoe.

Length, 7.25; wing, 4.50.

Hab.—Europe generally; Asia; Madeira; Bermuda (accidental); Egypt and N. Africa.

Mr. Hurdis shot the only example of this well-known bird on June 12, 1850. It had no appearance of being an escaped cage bird, and I do not see why a strong gale should not have driven it even to such a distance from its ordinary line of flight. Professor Newton, in his fourth edition of Yarrell's "British Birds," alludes to this specimen in describing the geographical distribution of the species, but seems inclined to doubt its being a genuine wild bird. It is worthy of remark that this unfortunate bird was described to Mr. Hurdis by a "coloured" lad as being "less than a pigeon, and of a light-green colour about the neck"; also as making a "curious noise" in the air, and as not knowing apparently "how to get down again," finally "tumbling down like a stone." This is a fair sample of the information one may expect in Bermuda.

Family SYLVICOLIDÆ.

Subfamily SYLVICOLINÆ.

Genus MNIOTILTA, Vieill.

12. *Mniotilta varia*, (Linn.) Vieil. Black and White Creeping Warbler.

Motacilla varia, Linn.
Certhia varia, Vieil., Aud.
Mniotilta varia, Vieil., Bp., Ord., Aud., and of later writers.
Sylvia varia, Bp.
Sylvicola varia, Rich.
Certhia maculata, Wils.
Mniotilta borealis, Nutt.
M. varia var. *longirostris*, Bd.

Length, 5 inches; wing, 2.85; tail, 2.25.

Hab.—Eastern North America, north to fur countries in summer; south to Mexico, Central America, and West Indies; west to Kansas and Missouri as high as Fort Pierre (Hayden); Bermuda (Coues).

In October, 1849, one example of this neat little warbler was shot at St. George's, and two or three more seen between that town and Hamilton. One was obtained at Ireland Island on October 27, 1852. Mr. J. M. Jones shot one in Devonshire Marsh in January, 1871. I found them quite common in the autumn of 1874 and winter succeeding it, and obtained several specimens, chiefly in the tall cedars of Devonshire Swamp and around Hungry Bay. This bird was one of my especial favorites, and I used to sit for hours watching its quick and graceful motions, and its dexterity in capturing insects. Its mode of "registering" branch after branch, commencing at the bottom and ending at the outermost twigs, is very like that of the Titmice.

Mr. Bartram informs me that he shot a specimen in good plumage on the 4th May, 1878. This must have been a spring visitor on its northward journey, I imagine.

Genus PARULA, Bp.

13. *Parula americana*, (Linn.) Bp. Blue Yellow-backed Warbler.

Parus americanus, Linn.
Motacilla americana, Gm.
Sylvia americana, Lath., Ord.
Sylvicola americana Ord. Woodh.
Parula americana, Bp., Gosse, Bd., Hayd., and late writers.
Ficedula ludoviciana, Briss.
Motacilla ludoviciana, Gm.
Motacilla eques, Boddaert.
Sylvia torquata, Vieil.
Sylvia pusilla, Wils.
Sylvicola pusilla, Sw.

Length, 4.75; wing, 2.34; tail, 1.90.

Hab.—Eastern North America, south to Guatemala, north to Nova Scotia, west to Missouri, Mexico, West Indies, Greenland (Coues).

This diminutive bird seems hardly fitted for a journey of 600 miles across the ocean. Nevertheless, five examples are on record, viz, one shot by Canon Tristram at Ireland Island, on April 21, 1849; one found by Mr. Hurdis in 1853, in a collection of Bermuda skins sent to him for examination; two others seen by myself, one being shot near Devonshire Swamp on October 19, 1874. My bird proved to be a male in brilliant plumage; the other, probably a female, escaped. The two were fluttering and creeping about at the extreme end of a large cedar branch, like a veritable *Parus*. Mr. Bartram shot one near his house on the 26th March, 1878.

Genus PROTONOTARIA, Bd.

14. *Protonotaria citrœa*, (Bodd.) Bd. **Prothonotary Warbler.**

Motacilla citrœa, Bodd.
Mniotilla citrœa, Gray.
Protonotaria citrœa, Bd. and later authors.
Helminthophaga citrœa, Cab.
Motacilla protonotarius, Gm.
Sylvia protonotarius, Lath., Vieil., Wils., Bp., Nutt., Aud.
Vermivora protonotarius, Bp., Woodh., Hoy.
Helinaia protonotarius, Aud.
Helmitherus protonotarius, Bp.

Length, 5.40; wing, 2.90; tail, 2.25.

Hab.—South Atlantic and Gulf States to Maryland and Pennsylvania, and even Maine, Ohio, Illinois, Kentucky, Kansas, Missouri, Cuba, Panama (Coues).

I had the pleasure of examining and identifying a specimen of this handsome warbler, the only one yet obtained, in Mr. Bartram's collection. It was presented to him by Mr. Hyland, jr., of Saint George's, who shot it, near that town, out of a small flock of the species, in the autumn of 1874, and had just been preserved when I saw it.

Genus DENDROICA, Gray.

15. *Dendroica œstiva*, (Gm.) Bd. Blue-eyed Yellow Warbler; Summer Warbler.

Motacilla œstiva, Gm.
Sylvia œstiva, Lath., Vieil., Aud., Nutt.
Sylvicola œstiva, Sw. & Rich., Aud., Woodh., Hoy.
Dendroica œstiva, Bd., Coues and late writers.
Sylvia carolinensis, Lath.

Sylvia flava, Vieil.
Sylvia citrinella, Wils.
Sylvia childreni, Aud.
Sylvia rathbonia, Aud.

Length, 5.25; wing, 2.66; tail, 2.25.

Hab.—Whole of North America through Mexico and Central America into South America; West Indies (represented by several insular forms apparently not specifically distinct) (Coues).

Mr. Bartram has two specimens in his collection obtained by himself at different dates. Lieutenant Denison, Royal Engineers, has also two, both males, shot in Devonshire Swamp on the 23d November, 1875.

16. *Dendroica virens*, (Gm.) Bd. Black-throated Green Warbler.

Motacilla virens, Gm.
Sylvia virens, Lath., Vieil., Wils., Bp. Nutt., Aud.
Sylvicola virens, Bp., Aud., Woodh., Reinh.
Rhimanphus virens, Cab., Scl.
Mniotilta virens, Gray, Reinh.
Dendroica virens, Bd. and later writers generally.

Length, 5.00; wing, 2.58; tail, 2.30.

Hab.—Eastern United States to Missouri; south to Guatemala; accidental in Greenland and Europe.

Another novelty brought to light in examining Mr. Bartram's birds. He has three examples, one in the obscure plumage of youth, the others in the "fall" or female plumage of the adult.

A recent letter from Mr. Bartram contains the following: "On the 7th of May (1878) I shot a black-throated green Warbler showing a triangular jet-black patch under the chin and throat, length 4¾ inches, wing 2¼, tail 2."

17. *Dendroica cœrulescens*, Bd. Black-throated Blue Warbler.

Motacilla cœrulescens, Gm.
Sylvia cœrulescens, Lath., Vieil.
Dendroica cœrulescens, Bd., Mayn., Coues.
Motacilla canadensis, Linn.
Sylvia canadensis, Lath., Wils., Bp., Nutt., Aud.
Sylvicola canadensis, Sw., Rich., Bp., Aud.
Mniotilta canadensis, Gray.
Dendroica canadensis, Bd., Scl., and other late authors.
Sylvia pusilla, Wils.
Sylvia leucoptera, Wils.
Sylvia sphagnosa, Bp., Nutt., Aud.

Length, 5.50; wing, 2.60; tail, 2.25.

Hab.—Eastern United States to the Missouri. West Indies. (Baird.)

Two specimens of this striking-looking Warbler are in the Bartram collection, shot by Mr. Bartram in a field of arrow-root on his farm not many years since. No others are recorded.

18. *Dendroica coronata*, (Linn.) Gray. Yellow-rump Warbler.

Motacilla coronata, Linn.
Sylvia coronata, Lath., Vieil., Wils., Nutt., Aud.
Sylvicola coronata, Sw. & Rich., Aud.
Dendroica coronata, Gray, Bd., Coues, and late writers generally.
Mniotilta coronata, Gray, Reinh.
Sylvia xanthopygia, Vieil.

Length, 5.65; wing, 3.00; tail, 2.50.

Hab.—North America, excepting southwest Territories; in the Northwest, across the continent, thence south along the Pacific coast to Washington Territory, Colorado, Arctic coast, Greenland, Mexico, Central America, West Indies. (Coues.)

Several examples are recorded in "The Naturalist in Bermuda." Three of these were shot on Somerset Island by Captain Tolcher, Fifty-sixth Regiment, out of a flock of more than a hundred birds. In the Bartram collection are four specimens. It was the commonest species I met with in November and December, 1874, in the course of my evening rambles among the cedar groves of Devonshire parish. Here I obtained a few specimens, and could have shot many more had I wished. They were rather shy, and flew rapidly from tree to tree, with a loud "chip" of alarm, showing the brilliant yellow of the rump plainly. Those I shot were all in winter plumage, the yellow crown concealed by brown feathers.

19. *Dendroica castanea*, (Wils.) Bd. Bay-breasted Warbler.

Sylvia castanea, Wils., Bp., Nutt., Aud.
Sylvicola castanea, Rich., Bp., Aud., Hoy.
Mniotilta castanea, Gray.
Rhimanphus castaneus, Cab.
Dendroica castanea, Bd., Scl. & Salv., Lawr., Mayn., Coues.
Sylvia autumnalis, Wils., Nutt., Aud.

Length, 5.00; wing, 3.05; tail, 2.40.

Hab.—Eastern Provinces of North America to Hudson's Bay; Guatemala, south to Isthmus of Darien. Not recorded from Mexico or West Indies. (B. B. & R.)

A young bird in the Bartram collection is the sole representative of the species. It is in obscure plumage, but shows the buffy tint on the sides of the body so characteristic of the species.

20. *Dendroica maculosa*, (Gm.) Bd. Black and Yellow Warbler.

Motacilla maculosa, Gm.
Sylvia maculosa, Lath., Vieil., Aud., Nutt.
Sylvicola maculosa, Sw. & Rich., Aud., Hoy.
Dendrocia maculosa, Bd., and later authors generally.
Sylvia magnolia, Wils.

Length, 5.00; wing, 2.50; tail, 2.25.

Hab.—Eastern North America to Fort Simpson; Eastern Mexico to Guatemala and Panama; Bahamas; Cuba (very rare). (B. B. & R.)

Mr. Bartram writes to me: "On the 7th May, 1878, I shot a Magnolia Warbler. * * * This is new to the Bermuda lists."

21. *Dendroica discolor*, (Vieil.) Bd. Prairie Warbler.

Sylvia discolor, Vieil., Bp., Nutt., Aud.
Sylvicola discolor, Jard. Rich., Bp., Aud., Gosse.
Mniotilta discolor, Gray.
Dendroica discolor, Bd. and later authors.
Sylvia minuta, Wils.

Length, 4.86; wing, 2.25; tail, 2.10.

Hab.—Eastern United States as far north as Massachusetts, west to Kansas; breeds throughout its range; winters in Florida and abundantly in most of the West Indian islands. Not recorded from Mexico or Central America. (Coues.)

Only one, obtained by Colonel Wedderburn at the dockyard, Ireland Island, on the 3d October, 1848.

22. *Dendroica palmarum*, (Gm.) Bd. Yellow Red-poll Warbler.

Motacilla palmarum, Gm.
Sylvia palmarum, Lath., Vieil., Bp.
Dendroica palmarum, Bd. and later authors.
Sylvia petechia, Wils., Nutt., Aud.
Sylvicola petechia, Sw. & Rich., Aud., Hoy.
Sylvicola ruficapilla, Bp.

Length, 5.00; wing, 2.42; tail, 2.25.

Hab.—Eastern Province of North America to Fort Simpson and Hudson's Bay; Bahamas, Jamaica, Cuba, and Saint Domingo, in winter. Not noted from Mexico or Central America. (B. B. & R.)

Two shot by Colonel Wedderburn in Pembroke Marsh, on December 17, 1847, and December 3, 1848, respectively. Mr. Bartram has two other specimens, obtained by himself.

23. *Dendroica pinus*, (Wils.) Bd. Pine-creeping Warbler.

Sylvia pinus, Wils., Nutt., Aud.
Sylvicola pinus, Jard., Rich. & Bp., Aud., Woodh.
Rhimamphus pinus, Bp.
Dendroica pinus, Bd. and later authors.
Sylvia vigorsii, Aud.
Vireo vigorsii, Nutt.

Length, 5.50; wing, 3.00; tail, 2.40.

Hab.—Eastern United States to the Lower Missouri, north to Canada and New Brunswick, but not to Labrador. Not recorded in West Indies, except Bahamas. Bermuda. (Coues.)

Has occurred in considerable numbers. A good many occurred on September 27, 1849, departing again in a few days. Several were captured outside the lantern of the light-house in the dark and rainy night of the 5th September, 1850. On October 15, 1850, Colonel Drummond obtained specimens from a large flock, which he observed coming in from the sea and settling on some trees within the keep at Ireland Island. Mr. Bartram has two specimens, one of which (a male in spring plumage) was shot near his house and brought to him while I was paying him a visit on March 16, 1875. The species would seem, therefore, to visit the islands on both migrations.

Under date 4th February, 1878, Mr. Bartram writes to me: "One dark stormy night last October, a Pine-creeping Warbler flew into the museum; it is now alive and well, and eats bread and milk."

Sub-family GEOTHLYPINÆ.

Genus SEIURUS, Sw.

24. *Seiurus aurocapillus* (Linn.), Sw. Golden-crowned Thrush.

Motacilla aurocapilla, Linn., Gm.
Turdus aurocapillus, Lath., Wils., Nutt., Aud.
Sylvia aurocapilla, Bp.
Seiurus aurocapillus, Sw. & Rich., Aud., Bd., and later authors.
Accentor aurocapillus, Rich.
Enicocichla aurocapilla, Gray.
Henicocichla aurocapilla, Cab. Gundl., Scl.
Turdus coronatus, Vieil.

Length, 6.00; wing, 3.00; tail, 2.40.

Hab.—Eastern Province of North America; west to Platte and Yellowstone, thence to Alaska; winters sparingly in Florida and along the Gulf coast; Mazatlan, West Indies; Mexico; Central America (Coues).

I shot the first recorded specimen on the edge of Devonshire Swamp, on the 19th October, 1874. This brought to light another, shot in the autumn of 1873, and set up in a case with Blue and Red Birds by Gibbs, an old soldier of the Fifty-third Regiment, and an excellent taxidermist, in the service of Lieutenant Johnston, Royal Engineers. I afterwards identified two others, killed a few years ago, in Mr. Bartram's possession. The species was numerous in the autumn of 1874, in and near Devonshire Swamp, and I procured specimens on the 24th October and on the 12th and 16th December, thus establishing it as a real 'Mudian. I wonder it had hitherto escaped notice; its loud "peche, peche" is very striking, and drew my attention at once to the presence of something new. It was very shy.

25. ***Seiurus noveboracensis***, (Gm.) Nutt. Small-billed Water Thrush.

Motacilla noveboracensis, Gm.
Sylvia noveboracensis, Lath., Vieil., Bp.
Turdus (Seiurus) noveboracensis, Nutt.
Seiurus noveboracensis, Bp., Aud., Bd., and later authors.
Henicocichla noveboracensis, Cab., Scl., Gundl., Scl. & Salv.
Enicocichla noveboracensis, Gray.
Turdus aquaticus, Wils., Aud.
Seiurus aquaticus, Sw. & Rich.
Sylvia anthoides, Vieil.
Seiurus tenuirostris, Sw., Gamb.
Seiurus gossii, Bp.

Length, 6.15; wing, 3.12; tail, 2.40; bill from rectus, .64.

Hab.—Eastern North America, straggling westward along United States boundary to Montana and Washington Territory; Alaska; Arizona; Mexico; West Indies; Central America; Northern South America (Coues).

One of the commonest but most interesting of autumnal visitors. It appears regularly early in October and a few remain all the winter. Throughout October and November there is hardly a mangrove swamp, great or small, whence its sharp but musical "chip" may not be heard at any time during the day. Early in the morning, especially when an ebbing tide has left bare the quaint tangled roots of the mangroves and their muddy surroundings, it is comparatively easy to approach this wary little bird, but later in the day it requires great caution, and a certain amount of activity, to procure a specimen. To persons out of training, requiring strong exercise, I can confidently recommend a protracted "stalk" after *Seiurus* among the mangrove roots, such as I undertook myself before becoming better acquainted with the habits of the species. These birds wag the tail like a *Motacilla*, as they feed on the edges of the tidal pools, and flit from root to root, uttering at times their loud monotonous cry. While waiting for ducks at daylight in the larger swamps, I have seen them within a few yards of me, in happy ignorance of my presence. Colonel Wedderburn says (Nat. in B., p. 27), "Several times, at Riddle's Bay, I have noticed seemingly a larger species of this bird, but never succeeded in killing any of them." This was perhaps the larger-billed variety (or species), *S. ludovicianus*. I did not meet with any specimens myself.

Genus GEOTHLYPIS, Cab.

26. *Geothlypis trichas*, (Linn.) Cab. **Maryland yellow-throat.**

Turdus trichas, Linn., Gm.
Sylvia trichas, Lath., Vieil., Nutt., Ord, D'Orbig.
Geothlypis trichas, Cab., Bd., and later authors.
Ficedula trichas & marilandica, Briss.
Sylvia marilandica, Wils., Bp.
Trichas marilandica, Bp., Ord, Woodh., Hoy.
Trichas personatus, Sw.
Sylvia roscoe, Aud.
Trichas roscoe, Nutt.

Length, 4.40; wing, 2.15; tail, 2.30.

Hab.—North America, from Atlantic to Pacific; Bahamas; Cuba; Jamaica (B. B. & R.).

By no means a frequent visitor, only two specimens being known. The first was shot by Mr. Hurdis in a bushy swamp near the sluice-gates on the 18th October, 1853; the second is in Mr. Bartram's museum, obtained near Stocks Point.

Sub-family SETOPHAGINÆ.

Genus MYIODIOCTES, Aud.

27. *Myiodioctes mitratus*, (Gm.) Aud. **Hooded Fly-catching Warbler.**

Motacilla mitrata, Gm.
Sylvia mitrata, Lath., Vieil., Bp., Nutt., Aud.
Sylvania mitrata, Nutt., Woodh.
Setophaga mitrata, Jard., Gray.
Wilsonia mitrata, Bp., All., Allen.
Myiodioctes mitatus, Aud., Bp., Sclater, Bd., and modern authors.
Sylvicola mitrata, Maxim.
Myioctonas mitratus, Cab.
Muscicapa cucullata, Wils.
Muscicapa selbyi, Aud., Nutt.

Length, 5.00; wing, 2.75; tail, 2.55.

Hab.—Eastern Province of United States, rather southern; Bermuda; Cuba; Jamaica; Eastern Mexico; Honduras; and Guatemala to Panama R. R.; Orizaba; Yucatan (B. B. & R.).

A male shot at Ireland Island by Mr. Abbott, Twentieth Regiment, on March 30, 1847. A female was seen but not obtained.

Genus SETOPHAGA, Sw.

28. *Setophaga ruticilla*, (Linn.) Sw. **American Redstart.**

Muscicapa ruticilla, Linn., Gm., Vieil., Wils., Aud.
Setophaga ruticilla, Sw., Sw. & Rich., and modern authors.
Sylvania ruticilla, Nutt.
Motacilla flavicauda, Gm.

Length, 5.25; wing, 2.50; tail, 2.45.

Hab.—Chiefly Eastern North America, north to Fort Simpson, west to Utah, south through Mexico and Central America to Ecuador; West Indies (Coues).

Two in Mr. Bartram's possession, shot by him near his house some few years since. No others are on record.

Family TANAGRIDÆ.

Sub-family TANAGRINÆ.

Genus PYRANGA, Vieil.

29. ***Pyranga rubra*** (Linn.) Vieil. Scarlet Tanager.

Tanagra rubra, Linn., Gm., Wils., Bp., Nutt., Aud.
Pyranga rubra, Vieil., Sw. & Rich., Jard., Bp., Aud., Gir., and modern authors.
Phœnisoma rubra, Sw.
Phœnicosoma rubra, Cab.
Pyranga erythromelas, Vieil.

Length, 7.40; wing, 4.00; tail, 3.00.

Hab.—Eastern Province of North America, north to Winnepig. In winter, south to Ecuador, Bogota, Cuba, Jamaica, Costa Rica, Vera Cruz. (B. B. & R.)

This handsome bird has visited the Bermudas on its vernal migration on several occasions. Two or three examples were obtained in April, 1850; four were seen, and one shot, in May, 1851. Mr. Bartram has several specimens, male and female, and obtained a splendid male near his house early in May, 1875. One was seen and nearly captured after an exciting hunt by Lieutenant Denison, R. E., at Somerset, on April 25, 1875. Mr. J. M. Jones informs me that a male was shot on the edge of the lagoon at Ireland Island on May 6, 1869; also that another frequented a garden in Smith's Parish for several days at the beginning of May, 1875. The female is such an obscure-looking bird that she doubtless often escapes the notice invariably accorded to her brilliant partner. There is no recorded instance of the occurrence of this species on its southward journey. Captain Rooke, Fifty-third Regiment, and I saw what we took to be a female Scarlet Tanager on October 17, 1874, near Basden's Pond, but we could not get a shot to confirm our suspicion.

30. ***Pyranga æstiva***, (Gm.) Vieil. Summer Red-bird.

Muscicapa rubra, Linn.
Tanagra æstiva, Gm., Wils., Bp., Nutt., Aud.
Pyranga æstiva, Vieil., Bp., Lins., Woodh., Scl., and of late writers.

Length, 7.20; wing, 3.75; tail, 3.00.

Hab.—Eastern Province United States, north to about 40°, west to borders of the plains. In winter, south through the whole of Middle America (except the Pacific coast) as far as Ecuador and Peru, Cuba, Jamaica. (B. B. & R.)

The same remarks apply to this species, with reference to its visits to the islands, as to the preceding. It appears to have been especially numerous in April, 1850, when a female was shot on the 9th; a beautiful male, by Colonel Wedderburn, at Peniston's Pond, on the 19th; two by the same gentleman, at Harris's Bay, on the 20th; and several others. Mr. Bartram has a male and two females, one of the latter killed a year or two since. On the 29th of April, 1875, I shot a fine female in Smith's Marsh; it was in wonderful condition, the body being literally coated with layers of orange-colored fat. The stomach was full of the remains of the Bermuda wasp—a most unpalatable-looking morsel. Wilson alludes to the insectiverous habits of this species.

Family HIRUNDINIDÆ.

Sub-family HIRUNDININÆ.

Genus HIRUNDO, Linn.

31. ***Hirundo horreorum***, Barton. Barn Swallow.

Hirundo rufa, Vieil., Bp., Nutt., Woodh., Cass., Cab., Brewer.
Hirundo horreorum, Barton, Bd., and of late writers.
Hirundo americana, Wils., Sw. & Rich., Lemb.
Hirundo rustica, Ord., Gir., Jones.

Length, 6.90; wing, 5.00; tail, 4.50.

Hab.—North and Middle America, north to Alaska; Greenland; West Indies. (Coues.)

I shall take the liberty of quoting from the "Naturalist in Bermuda," to illustrate the uncertain appearance of the swallow tribe in the islands. Mr. Hurdis says (p. 68): "I can with safety affirm that from October, 1840, to September 12, 1846, not a swallow of any description came under my observation, though I believe they were sufficiently common in the September of the former year." Colonel Wedderburn says of this species (p. 34): "Rarely seen in April and May, but sometimes numerous in August and September. I have seen it as early as August 1, in the year 1848, at Hamilton, and they were numerous on that day at Hungry Bay and Riddle's Bay. This species was very numerous in the great flight of swallows in September, 1849." A few swallows, probably of this species, appeared in August, 1874, but I was away at the time.

From April 30 to May 11, 1875, there were not a few visitors, and several specimens were obtained. Five of these birds frequented the grassy slopes in the vicinity of Warwick Camp, while I was going through the annual course of musketry there with my company. They disappeared on May 11, without my having been able to procure a specimen.

32. *Hirundo bicolor*, Vieil. White-bellied Swallow.

Hirundo bicolor, Vieil., Bp., Aud., Nutt., Gir., and most writers.
Chelidon bicolor, Less., Bp.
Tachycineta bicolor, Cab., Gundl., Sumich., Allen, Coues.
Herse bicolor, Bp.
Petrochelidon bicolor, Scl., Scl. & Salv.
Hirundo viridis, Wils.

Length, 6.25; wing, 5.00; tail, 2.65.

Hab.—Whole United States, and north to Slave Lake, south to Guatemala; Bermuda; Cuba, common in winter; breeds on table-lands of Mexico; accidental in England.

This Swallow visited the Bermudas in the great flight of September, 1846, when it appeared in considerable numbers. Lieutenant Denison obtained one, shot at St. George's in September, 1875.

Genus COTYLE, Boie.

33. *Cotyle riparia*, (Linn.) Boie. Bank Swallow.

Hirundo riparia, Linn., Gm., Lath., Wils., Bp., Sw. & Rich., Nutt., Aud., Gir., and of earlier authors generally.

Cotyle riparia, Boie, Bp., Woodh., Cass., Cab., and of nearly all late writers.
Hirundo cinerea, Vieil.

Length, 4.75; wing, 4.00; tail, 2.00.

Hab.—Europe; the whole of North America; Bermuda; Cuba; Jamaica; winters from the southern coast southward; not common on the Pacific side; Brazil. (Coues.)

Identical with the European bird. Two specimens were shot by Captain Lye, in September, 1846; and a few seen near Hamilton on August 8, 1847.

Genus PROGNE, Boie.

34. *Progne purpurea*, (Linn.) Boie. Purple Martin.

Hirundo subis, Linn.
Progne subis, Bd., Coues, Sumich., Steph.
Hirundo purpurea, Linn., Gm., Lath., Wils., Bp., Aud., Nutt., Gir.
Progne purpurea, Boie, Bp., Woodh., and later writers.
Hirundo violacea, Gm.
Hirundo cærulea, Vieil.
Hirundo versicolor, Vieil.
Hirundo ludoviciana, Cur.

Length 7.50; wing, 6.00; tail, 3.40.

Hab.—United States and British Provinces, north to Canada a the Saskatchewan; Mexico; Cuba(?); accidental in Great Brita (Coues.)

This fine bird, a straggler to the British lists, has only appeared on o occasion, during the "entrada" of September, 1849, when it was n merous.

Family AMPELIDÆ.

Sub-family AMPELINÆ.

Genus Ampelis, Linn.

35. ***Ampelis cedrorum***, Vieil. Cedar-bird.

Ampelis garrulus, var β, Linn.
Bombycilla cedrorum, Vieil, Cab.
Ampelis cedrorum, Scl., Bd., and late writers.
Bombycilla carolinensis, Briss., Bp., Aud., Nutt., Gir.
Ampelis carolinensis, Gosse, Bp.
Ampelis americana, Wils.
Bombycilla americana, Sw. & Rich.

Length, 7.25; wing, 4.05; tail, 2.60.

Hab.—North America generally, up to 54° north; Mexico and Cen tral America; Bermuda; Jamaica; Cuba. (Coues.)

Occurs rarely, both on its autumnal and vernal flights. Three were shot out of a flock of about thirty, near Hungry Bay, on October 1 1847; four on December 17 following, one of which had a few of the brilliant wax-like tips to the secondaries; two out of a flock of twelve in December, 1849; one seen on January 5, 1850; one shot on the 6th and another on the 10th April, 1850; one on December 2, 1851. In addition to these Mr. Bartram has three specimens, obtained at different dates. I did not myself meet with the species, or hear of its occurrence, during my stay. Two were shot out of a flock of five on the 11th, and a third on the 22d September, 1875, in Devonshire Swamp by Lieutenant Festing, Twentieth Regiment. A male bird of this species was obtained near Prospect, on November 24, 1875.

Family VIREONIDÆ.

Sub-family VIREONINÆ.

Genus Vireo, Vieil.

36. *Vireo noveboracensis*, (Gm.) Bp. White-eyed Vireo.

Muscicapa noveboracensis, Gm.
Vireo noveboracensis, Bp., Nutt., Aud., Gir., Cass., and later writers.
Vireo musicus, Vieil.
Muscicapa cantatrix, Wils.

Length, 4.90; wing, 2.40; tail, 2.20.

Hab.—United States west to base of Rocky Mountains; south to Guatemala; Very rare in Cuba. Abundant and resident in the Bermudas. (B. B. & R.)

The smallest and one of the commonest resident Bermuda birds, familiar to all through its sprightly ways, loud song, and astounding impudence. It is termed locally, "chick-of-the-village," or, "chick-choo-willie," from its note. This is, however, very variable, and hardly any two birds give it the same rendering. One has a prefatory "chick," in addition; another tacks the extra "chick" on at the end of his version; while others cut it short, or jumble it all up together at random. One particular variety is "ginger-beer-quick," a call very much adapted to the climate of Bermuda. In short, there is no end to the variations; and a stranger might well imagine, as I did myself at first, that there was more than one species present. It was some little time before I settled the matter to my own satisfaction by careful observation of every "chick" I heard singing, as I expected to meet with *V. gilvus* or *V. belli* among the numerous musicians. The color of the iris increased my difficulty, as I found it to be brownish, brownish-gray, or gray—rarely white, as stated by authors. I presume it is only fully adult birds that show the real white iris; young birds have it decidedly brownish, and I have seen a female sitting on eggs with an undeniable brownish-gray "cast" in her bright little eye. It would be a waste of time and valuable space to describe the pretty pensile nest of this species, so familiar to all ornithologists. I have found it usually from three to twelve feet above the ground, in cedars, mangroves, Bermuda "holly," pomegranate, and lemon trees, but most commonly in cedars. I never met with more than *three* eggs or young in one nest in the islands; authors assign four or five to the genus. The eggs average .71 inch by .52 inch, white, with a few dark-brown or black dots; some are entirely white. The young at first have the yellow of the wing bars and forehead very pale and dingy. This is a sad little torment to the collector. It comes hissing and scolding within a foot of one's head, puffing itself out with malignant fury. I have touched one with my gun in the thick bushes before it would budge an inch. And when one is on the *qui vive* for rarities among the big cedars, the little wretches will come from all parts to irritate and deceive one, playing all sorts of antics on the topmost branches, apparently imitating the movements of a *Dendroëca* or other *Sylvicolidæ*, in order to induce one to waste a charge on them. Several times they succeeded with me; and on one occasion, the bird having lodged at the top of a very ugly-looking tree, I tore my hands and clothes to pieces in my anxiety to secure the supposed prize. But in spite of this I have a great regard for the cheerful, restless little fellows, whose presence does so much to relieve the monotony of the everlasting cedars. They are very dexterous in catching insects among the foliage, their manner of feeding seeming to be intermediate between that of a Flycatcher and a Warbler. You can hear the "snip" of their mandibles as they secure their prey for a considerable distance. I have seen one catching flies off the back of a cow, jumping vigorously at them from the ground, and "snipping" them off neatly as they buzzed round the recumbent animal. Mr. Hurdis says (Nat. in B., p. 71): "In September it delights to feed on the small white berries of the sweet-scented *Tournefortia*, and it is also fond of the small fiery capsicum, known by the name of 'bird-pepper,' the pods of which it plucks and swallows entire." It is on record that the newly-fledged young of this species have been found entangled in the meshes of the web of the "silk" spider *Epëira clavipes*. These webs are of great size and strength, extending for many feet between adjoining cedars, and the number of them among the woods in summer and autumn is almost incredible. In all my rambles, however, I never met with an instance of poor little *Vireo* having walked into *Epëira's* parlor.

Genus VIREOSYLVIA, Bonap.

37. *Vireosylvia olivacea*, (Linn.), Bp. Red-eyed Vireo.

Muscicapa olivacea, Linn., Wils.
Lanius olivaceus, Licht.
Vireo olivaceus, Vieil., Bp., Sw., Aud., Bd.
Vireosylvia olivacea, Bp., Reinh., Scl., and late writers.
Vireo virescens, Vieil., Gray.
Vireo bogotensis, Bryant, Lawr.

Length, 6.33; wing, ♂, 3.33; tail, 2.50.

Hab.—Whole of Eastern North America, west to base of Rocky Mountains, south to Panama and Bogota; very rare in Cuba, only West Indian locality; accidental in England; Trinidad. (B. B. & R.)

The first recorded specimen was brought to me in the flesh on the 14th October, 1874. It had just been captured in the officers' quarters at Prospect Camp. In March, 1875, I identified three specimens in Mr. Bartram's collection, shot by himself at different times near Stocks Point. Mr. Bartram informs me that he shot one on the 13th October, 1878

Family LANIIDÆ.

Sub-family LANIINÆ.

Genus COLLURIO, Bd.

8. ***Collurio borealis***, (Vieil.) Bd. Great Northern Shrike.

Lanius borealis, Vieil., Sw. & Rich., Aud., Gir., Cass., &c.
Lanius excubitor, Forst., Wils., Aud.
Collyrio borealis, Bd., Cooper & Suck., Coues & Prent., Hayd., Dall & Bann.
Collurio borealis, Bd., Coues, Cooper, &c.
Lanius septentrionalis, sp., Cass., Murray.
Collyrio chemungensis, Gregg.

Length, 9.85; wing, 4.50; tail, 4.80.

Hab.—North America, in winter south to about 35°; Alleghanies, breeding; Bermuda. (Coues.)

Not a great many have occurred, though it would appear to visit the islands on both migrations. One was shot by Dr. Cole, Twentieth Regiment, on October 31, 1846; one by Mr. Hurdis, January 23, 1847; another by Colonel Wedderburn, near Harris Bay, March 12, 1850; and a fourth by Mr. J. M. Jones, on the "Model" farm, Smith's parish, in January, 1872. Besides these, there are three specimens in Mr. Bartram's collection. Most of these above-mentioned examples were in immature plumage. One in Lieutenant Denison's collection was shot near the garrison instructor's house, at Prospect, on the 1st January, 1876.

It is strange that the other North American species, *C. ludovicianus*, of more southerly distribution on the continent than *C. borealis*, should not have been observed in Bermuda.

Family FRINGILLIDÆ.

Sub-family COCCOTHRAUSTINÆ.

Genus LOXIA, Linn.

9. ***Loxia curvirostra*** var. ***americana***, (Wils.) Coues. American Red Crossbill.

Loxia curvirostra, Forster, Bp., Nutt., Aud., Gir., Trippe.
Loxia curvirostra var. ***americana***, Coues, B. B. and R.
Curvirostra americana, Wils., Bd., Coop. & Suck., and most later U. S. authorities.
Loxia americana, Bp., Newb., Lawr., Finsch.

Length, 6.00; wing, 3.30; tail, 2.25.

Hab.—North America generally, coming southward in winter. Resident in the Alleghany and Rocky Mountains. (B. B. & R.)

Of this species Colonel Wedderburn says: "A specimen of this bird was captured in the dockyard at Ireland Island, January 20, 1850, and got quite tame, and lived for several days in my room; but poisoned itself by eating part of a composite candle, which it had cut nearly in half with its strong bill during the night. I shot three specimens near Mr. Ewing's house, April 5, 1850, and saw a small flock on several occasions near Pitt's Bay, but they were so shy I could not get near them. They disappeared early in May." Mr. Bartram has several specimens. On November 17, 1874, three were observed on some cedar trees at Prospect Camp. Two males were shot among some sage bushes, near the shore at Warwick, by Gibbs, on the 25th of that month; and another male was obtained at Prospect about the same time. These may have been the trio originally seen. The stomachs of the two Warwick birds, on examination by myself, proved to be crammed with small green caterpillars, and contained no trace of seeds. The insectivorous nature of the Crossbill is not mentioned by Wilson; it is alluded to by Dr. Saxby in the "Birds of Shetland." This species must visit Bermuda both going and returning.

40. *Loxia leucoptera*, Gm. White-winged Crossbill.

Loxia leucoptera, Gm., Bp., Sw. & Rich., Nutt., Aud., Gir., Gould, Lawr., Finsch, B. B. & R.
Curvirostra leucoptera, Wils., Bd., and many U. S. authors.
Loxia falcirostra, Lath.
Crucirostra leucoptera, Brehme.

Length, 6.25; wing, 3.50; tail, 2.60.

Hab.—Northern parts of North America generally; Greenland; England (accidental). (B. B. & R.)

A less frequent visitor than the preceding, on its northward journey only. A fine male was killed on May 11, 1852, by a boy who had another in his possession; date unknown. An officer of the Fifty-sixth Regiment shot one, a female, at Somerset, in March, 1852. Mr. Bartram has obtained a pair, male and female. This bird has occurred several times in Great Britain, and it is somewhat remarkable that the preceding species, *C. americana*, has not yet paid us a visit. I expect it will find its way across the Atlantic some day, and share the fate of every unfortunate straggler to our inhospitable shores.

Genus ÆGIOTHUS, Cab.

41. *Ægiothus linaria*, (Linn.) Cab. Red-poll Linnet.

Fringilla linaria, Linn., Gm., Wils., Temm., Bp., Nutt., Aud.
Passer linaria, Pall.
Linota linaria, Bp., Holb.
Ægiothus linarius, Cab., Bd., Coues, and late writers.
Linaria minor, Sw. & Rich., Aud., Gir., Trippe.
Fringilla borealis, Vieil.
Ægiothus fuscescens, Coues, Elliot.

Length, 5.50; wing, 3.10; tail, 2.70.

Hab.—The typical form in North America from Atlantic to Pacific, ranging irregularly southward in flocks in winter to the Middle States (sometimes a little beyond), and corresponding latitudes in the West. No late record of breeding in the United States. (Coues.)

Only recorded previously in 1847 and 1850. Two were obtained, February 8 and October 11, in the former year. In March, 1850, flocks of this bird appeared in the neighborhood of St. George's, and several specimens were obtained there and elsewhere throughout the islands. A goodly number visited the islands in small flocks in January, 1875; these were very tame at first, but soon became shy. Specimens were obtained during the month at all parts of the islands.

Genus CHRYSOMITRIS, Boie.

42. *Chrysomitris pinus*, (Wils.) Bp. Pine Linnet.

Fringilla pinus, Wils., Bp., Nutt., Aud.
Linaria pinus, Aud., Gir.
Chrysomitris pinus, Bp., Bd., Coop. & Luck., and later writers.
Chrysomitris macroptera, Dubus., Bp.

Length, 4.75; wing, 3.00; tail, 2.20.

Hab.—North America from Atlantic to Pacific; Vera Cruz, plateau and alpine region. (B. B. & R.)

Two specimens in Mr. Bartram's collection are the only ones on record. They were obtained near Stocks Point.

Genus PLECTROPHANES, Meyer.

43. *Plectrophanes nivalis*, (Linn.) Meyer. Snow Bunting.

Emberiza nivalis, Linn., Forster, Gm., Lath., Wils., Bp., Nutt., Aud.
Emberiza (Plectrophanes) nivalis, Bp., Sw. & Rich.
Plectrophanes nivalis, Meyer, and authors generally.
Emberiza montana, Gm., Lath.
Emberiza mustelina, Gm.
Emberiza glacialis, Lath.

Length, 6.75; wing, 4.35; tail, 3.05.

Hab.—Arctic America and Greenland, and corresponding latitudes in the Old World; irregularly southward in winter in the United States to about 35° in roving flocks. (Coues.)

This is a pretty constant visitor, seldom failing to make its appearance, in large or small numbers, in December or January. They were particularly numerous in 1850. I am credibly informed that of late years they have been seen in considerable numbers feeding on the parade ground and round about the stables, like sparrows, at Prospect Camp. One was seen there in December, 1874. Three, of which I procured one, frequented the Walsingham end of the Causeway in January, 1875. Others were seen at St. George's and elsewhere about the same time. This bird has not appeared in spring.

Genus PASSER, Briss.

44. *Passer domesticus*, Deg. & Gerbe. European House Sparrow.

Fringilla domestica, Linn.
Pyrgita domestica, Cuv.
Passer domesticus, Deg. & Gerbe, and European authors generally.

Length, 6.00; wing, 2.85; tail, 2.50.

Hab.—Europe; Asia; North Africa; Madeira.

Some few years ago a number of these birds were imported from New York (where they are now numerous), and turned out at St. George's; but many of them subsequently disappeared, probably victims to the cats which swarm in all parts of the islands. The remainder, however, appear to be flourishing, and in the spring of 1875 there were several nests in the new barracks above the town. A second importation, from New York also, took place in September, 1874, about fifty birds being liberated in the vicinity of Hamilton. These soon scattered in all directions, but about a dozen took up their quarters in the garden of the court-house at Hamilton, and could be seen there daily during the winter following. I have no doubt they will increase and multiply after their manner, and in time become as much a nuisance as they are now a curiosity. I certainly question the propriety of introducing these quarrelsome birds (for the sake of the war they wage on the insect tribe during the breeding season *only*) into the aristocratic society of the Blue and Red Birds, which they will infallibly drive, in course of time, out of the town gardens and inclosures altogether.

NOTE.—I may here mention that I observed a single specimen of the European Goldfinch, *Carduelis elegans*, near Harrington Sound, in April, 1875; it was very wild, and I could not get near it, but I imagine it must have been an escaped prisoner. This species is reported to have occurred in Massachusetts (Allen, Am. Nat. iii., p. 635), but the same explanation doubtless applies.

Sub-family SPIZELLINÆ.

Genus PASSERCULUS, Bp.

45. *Passerculus savanna*, (Wils.) Bp. Savanna Sparrow.

Fringilla savanna, Wils., Nutt., Aud.
Linaria savanna, Rich.
Emberiza savanna, Aud., Gir.
Passerculus savanna, Bp., Cab., Bd., and later writers generally.
Ammodromus savanna, Gray.
Passerculus alaudinus, Bp., Bd., Heerm., Coues, Dress., Elliot, &c.
Zonotrichia alaudina, Finsch.

Length, 5.50; wing, 2.70; tail, 2.10.

Hab.—Eastern North America to the Missouri plains, and northwest to Alaska; Cuba (winter). (B. B. & R.) Mexico. (Coues.)

Only two on record. Colonel Wedderburn killed one in Pembroke Marsh, April 11, 1850; I shot one at Shelly Bay Marsh on January 29, 1875.

Genus POOCÆTES, Bd.

46. *Poocætes gramineus*, (Gm.) Bd. Bay-winged Bunting.

Fringilla graminea, Gm., Bp., Aud., Nutt.
Emberiza graminea, Wils., Aud., Maxim., Trippe.
Zonotrichia graminea, Bp., Newb., Heerm.
Poocætes gramineus, Bd., Hayd., B. B. & R.
Pooecetes gramineus, Coues, and later authors generally.

Length, 6.25; wing, 3.10; tail, 2.50.

Hab.—United States, from Atlantic to Pacific, north to the Saskatchewan at least; winters in countless multitudes in the Southern States. (Coues.)

One shot by Captain M'Leod at St. George's, October 25, 1849. Lieutenant Denison fell in with a small party of these birds, and shot one of them at Whale Bay on the 9th of September, 1876.

Genus COTURNICULUS, Bp.

47. *Coturniculus henslowi*, (Aud.) Bp. Henslow's Bunting.

Emberiza henslowi, Aud., Gir.
Fringilla henslowi, Nutt.
Coturniculus henslowi, Bp., Bd., and late U. S. authors.
Ammodromus henslowi, Gray.

Length, 5.25; wing, 2.15; tail, 2.15.

Hab.—Eastern United States as far north as Massachusetts; westward to the Loup Fork of Platte. (B. B. & R.)

"Mr. Hurdis shot one specimen out of a small flock of these birds in Pembroke Marsh, on December 2, 1850. They had frequented the dense reeds and rushes for a fortnight previously." (Nat. in B., p. 30.)

Genus MELOSPIZA, Bd.

48. *Melospiza palustris*, (Wils.) Bd. Swamp Sparrow.

Fringilla georgiana, (Lath., ?), Nutt.
Fringilla palustris, Wils., Bp., Aud.
Fringilla (*Spiza*) *palustris*, Bp.
Passerculus palustris, Bp.
Ammodromus palustris, Aud., Gir., Putn., Trippe.
Melospiza palustris, Bd., and later authors.
Helospiza palustris, Bd., Allen.

Length, 5.75; wing, 2.40; tail,

Hab.—Eastern North America, from the Atlantic to the Missouri; north to Fort Simpson. (B. B. & R.)

A solitary example was obtained in Pembroke Marsh on December 3, 1849. I saw a bird in the Shelley Bay marshes in January, 1875, which I am almost certain belonged to this species, but I could not get a shot.

Genus JUNCO, Wagler.

49. *Junco hyemalis*, (Linn.) Sclater. Eastern Snow-bird.

Fringilla hyemalis, Linn., Bp., Lw. & Rich., Aud., Maxim.
Emberiza hyemalis, Linn., Lath.
Struthus hyemalis, Bp., Woodh.
Niphoea hyemalis, Aud., Gir., Putn., Trippe.
Junco hyemalis, Scl., Bd., and later writers.
Fringilla hudsonia, Forster, Gm., Wils.
Fringilla nivalis, Wils., Nutt.

Length, 6.25; wing, about 3.00.

Hab.—Eastern United States to the Missouri, and as far west as Black Hills; stragglers at Fort Whipple, Arizona, and mountains of Colorado. (B. B. & R.)

Two in the collection of Mr. Bartram were shot by him at Stocks Point.

Sub-family PASSERELLINÆ.

Genus PASSERELLA, Sw.

50. *Passerella iliaca*, (Merr.) Sw. Fox Sparrow.

Fringilla iliaca, Merr., Gm., Bp., Nutt., Aud., Putn., Trippe.
Fringilla (*Zonotrichia*) *iliaca*, Sw. & Rich.
Passerella iliaca, Sw., Bp., Bd., and late writers.
Fringilla rufa, Wils., Licht.
Fringilla ferruginea, Wils.
Passerella obscura, Verr.

Length, 7.50; wing, 3.50; tail, 2.90.

Hab.—Eastern province of North America, north 68° and Yukon; breeds from British Provinces northward; winters in Middle States sparingly, in the Southern States very abundantly; Western United States only to the edge of the central plains; accidental in California. (Coues.)

Only one yet obtained; shot by Mr. Bartram in a bush near his house a few years since.

Sub-family SPIZINÆ.

Genus GONIAPHEA, Bowditch.

51. ***Goniaphea ludoviciana***, (Linn) Bowd. **Rose-breasted Grosbeak.**

Loxia ludoviciana, Linn., Wils.
Fringilla ludoviciana, Bp., Nutt., Aud.
Guiraca ludoviciana, Sw., Bp., Bd., and late writers.
Coccothraustes (*Guiraca*) *ludoviciana*, Sw. & Rich.
Goniaphea ludoviciana, Bowd., Allen, Coues.
Coccoborus ludovicianus, Aud., Putn., Gir., Maxim., Trippe.
Hedymeles ludovicianus, Cab., Sclater., Lawr., Allen, B. B. & R.
Coccothraustes rubricollis, Vieil.
Loxia rosea, Wils.
Loxia obscura, Gm., Lath.
Fringilla punicea, Gm., Lath.

Length, 8.50; wing, 4.15.

Hab.—Eastern Province of North America, north to Labrador and the Saskatchewan; breeds from the Middle States northward; winters in Mexico and Central America; south to Ecuador; Cuba. (Coues.)

A female bird of this species was shot by Colonel Drummond on the 9th October, 1849, near St. George's, and a fine male by Mr. Hurdis on the 15th April, 1850. Mr. Bartram has four specimens, one of which is a male in immature plumage. A female was caught by a cat in the town of Hamilton on the 16th October, 1874. This species appears to visit Bermuda twice.

Genus CYANOSPIZA, Bd.

52. ***Cyanospiza cyanea***, (Linn.) Bd. **Indigo Bird.**

Tanagra cyanea, Linn.
Emberiza cyanea, Gm.
Fringilla cyanea, Wils., Bp., Nutt., Aud.
Passerina cyanea, "Vieil.," Gray.
Spiza cyanea, Bp., Aud., Gir., Woodh., Putn., Scl., Russ.
Cyanospiza cyanea, Bd., Scl. & Salv., Scl., and late author
Cyanoloxia cyanea, Bp.

Length, 5.75; wing, nearly 3.00.

Hab.—Eastern United States to the Missouri; south to Guatemala; Oaxaca; Cordova; Guatemala; Cuba; Costa Rica; Vera Cruz (B. B. & R.).

I had the pleasure of introducing this species into the Bermuda lists, the first specimen being a female shot near Devonshire Church, on January 14, 1875. In March following I examined an immature male, shot by Mr. Bartram on the 1st of that month, and also unearthed two dingy female specimens in his collection, killed some years previously. I obtained a female in Devonshire Marsh on the 8th, a young male on the 11th, and another on the 23d of March, and one or two others were subsequently procured in the same locality. There appeared to have been a regular "entrada" of them, and it was remarkable how pertinaciously they stuck to certain cedar groves round about Devonshire Church. I saw many others, and watched the changes of plumage of the male birds with great interest. By the end of April they had acquired the rich blue livery of the adult, and rivalled the Blue Bird in brilliancy of coloring. Lieutenant Tallents, of the Twentieth Regiment, shot a splendid specimen on April 29. This was the last we saw, and I imagine they all departed shortly afterwards, though we fondly hoped they might stay to breed. I found them easily approached at first, but when once disturbed they flew very rapidly away in the thick cedars. Their call-note was a loud, harsh "chee" or "tzee."

Genus CARDINALIS, Bp.

53. *Cardinalis virginianus*, (Briss.) Bp. Red-bird; Cardinal Grosbeak.

Coccothraustes virginianus, Briss.
Cardinalis virginianus, Bp., Woodh., Bd., Maxim., and late authors.
Loxia cardinalis, Linn., Gm., Lath., Wils.
Coccothraustes cardinalis, Vieil.
Fringilla cardinalis, Bp., Nutt., Aud.
Pitylus cardinalis, Aud., Gir., Hoy.

Length, 8.50; wing, 4.00; tail, 4.50.

Hab.—More southern portions of the United States to the Missouri. Probably along the valley of Rio Grande to the Rocky Mountains. (B. B. & R.)

The well-known Red Bird of Bermuda is an abundant resident throughout the islands, everywhere conspicuous by its brilliant plumage and loud but not unmusical song. This bird is a general favorite with all classes, and in great esteem as a cage-bird. Formerly considerable numbers were caught by the "colored" boys in the neat trap depicted in "The Naturalist in Bermuda"—an introduction, as I am informed, by Mr. J. M. Jones, from Somersetshire, and not a 'Mudian invention. Fortunately, however, there are now stringent local laws for the protection of the resident birds, and these traps are seldom seen. I have tried in vain to bring up the young from the nest. The Red Bird breeds twice a year in Bermuda. Fresh eggs have been found as early as the 1st April, and I find in my notes that I saw young birds just able to fly on the 19th; but these are exceptional cases. As a rule, the two clutches of eggs are deposited about April 10 and May 30, respectively. The eggs are three to five in number, averaging 1.00 inch x .73 inch. They vary much in size and markings, but are usually greenish white, irregularly marked with few purplish and many amber blotches. The nest is bulky, built of twigs and roots, lined with dry grasses. This lining alone serves to distinguish some of the nests from those of the Cat Bird, which they much resemble; they are usually at a greater elevation, however, and are never ornamented with rags or paper. The parent birds are extremely solicitous in bringing up their offspring, and attend them assiduously long after they are able to fly, betraying their anxiety by much "tick-tick-"ing, flirting of tails, and raising of crests. To see a fine old paterfamilias in all the glory of his rich vermilion garments, tail and crest in air, now on a post, now on an oleander or cedar bough, all the while uttering his sharp "tick" of alarm, while the more sober-colored mother is ministering to the appetites of the children, is a great treat, and will ever be associated in my memory with the hot sun, the white houses, dark cedars, and fragrant sage-bushes of Bermuda. The young resemble the female, being ashy-brown, paler below, with evident traces of the red on the crest, wings, tail, and under parts. I have mentioned the "tick," or call-note of this species. The song is exceedingly variable, consisting of a series of musical whistles. There is also a strange "whir-r-r-r," like a large bird suddenly rising on the wing, which is very peculiar. A most remarkable fact is that the notes are changed according to season. Mr. J. M. Jones called my attention to this too late, unfortunately, for me to make any lengthened study of the changes; but I heard sufficient to satisfy myself of their occurrence. Thus, in December and January nearly every songster I listened to was "way-too-"ing at the top of his voice, and I occasionally heard the peculiar "whir-r-r-r." Later on "way-too" became less frequent, being replaced by the monotonous "tew, tew," and other notes. A more careful and lengthened series of observations would be of considerable interest. In spring the Red Bird commences to sing at daybreak, considerably before the Blue Bird. A wounded Red Bird can give the unwary collector a most painful nip with his strong beak. In spite, however, of his strength, he allows himself to be driven ignominiously from his nest by the smaller Blue Bird, as already mentioned. The skin of this species is remarkably delicate, almost resembling tissue-paper. The rich vermilion plumage soon fades when exposed to light.

In proof of the migratory nature of this species Mr. Bartram writes to me, on the 27th of April, 1878, as follows: "Captain Tupper, of the barque Continental, belonging to the State of Maine, put in here in distress on a voyage from Brunswick, Ga., on or about the 12th of this month. He tells me that one of our Red Birds came on board his ship and was caught 350 miles to the westward of Bermuda; the wind had been eastward for some days; they also caught a Sandpiper the same day, and they were both confined together in a basket; but, as they could not live together without fighting, they were turned adrift and allowed to go their way."

Family ICTERIDÆ.

Sub-family AGELAINÆ.

Genus DOLICHONYX, Sw.

54. *Dolichonyx oryzivorus*, (Linn.) Sw. Bob-o-link; Rice-bird.

Emberiza oryzivora, Linn., Gm., Lath., Wils.
Passerina oryzivora, Vieil.
Dolichonyx oryzivorus, Sw., Bp., Aud., Gould, Gir., and late authors.
Icterus agripennis, Bp., Nutt., Aud.
Dolichonyx agripennis, Rich.

Length, 7.70; wing, 3.83; tail, 3.15.

Hab.—Eastern North America, north to Saskatchewan, west to Rocky Mountains and somewhat beyond; Utah, Nevada, Wyoming; south to Bolivia, La Plata, &c., Galapagos, West Indies, Central and South America. (Coues.)

Mr. Hurdis says of this bird: "The Rice Bird is not known to visit the Bermudas on its vernal flight, although in September and October it seldom fails of being found there, generally in small flocks, and on one occasion in considerable numbers. They frequent the marshes, where the ripe panicles of seed from the reeds and sedge offer an ample abundance of their favorite food." And Colonel Wedderburn remarks: "During some years this bird is not uncommon, but always found in winter plumage. They are so extremely fat that it is almost impossible to preserve them." I have little to add to the above notes, except that one of Mr. Bartram's specimens is a male in imperfect summer plumage.

I never met with the species myself, but they were familiar to many of my friends. They did not visit the Bermudas in the autumn of 1874, but were numerous in September, 1875.

Genus MOLOTHRUS, Sw.

55. *Molothrus pecoris*, (Gm.) Sw. Cow-bird; Cow Blackbird.

Fringilla pecoris, Gm., Lath., Licht., Sabine.
Emberiza pecoris, Wils.
Passerina pecoris, Vieil.
Icterus pecoris, Bp., Nutt., Aud.
Molothrus pecoris, Sw. & Rich., Bp., Aud., Gir., Bd., Trippe, and of writers generally.
Molobrus pecoris, Sundevall.
Molothrus ater, Gray.
Fringilla ambigua, Nutt.

Length, 8.00; wing, 4.42; tail, 3.40.

Hab.—Throughout temperate North America, north to 68°; winters in great numbers in the Southern States. (Coues.)

In Mr. Bartram's collection there is one example of this singular bird, which takes the place of our European Cuckoo in North America, building no nest, but depositing its eggs by stealth in the nests of Warblers, *Vireos*, Sparrows, &c. This solitary specimen is a male. It was shot at Stocks Point by Mr. Bartram.

Sub-family ICTERINÆ.

Genus ICTERUS, Auct.

56. *Icterus baltimore*, (Linn.) Daud. Baltimore Oriole; Golden Robin.

Oriolus baltimore, Linn., Gm., Wils.
Icterus baltimore, Daud., Bp., Nutt., Aud., Bp., and of late writers generally.
Yphantes baltimore, Vieil., Bp., Woodh.
Hyphantes baltimore, Cab., Lawr.
Icterus baltimorensis, Bp., Scl. & Salv., Coues, Trippe.

Length, 7.50; wing, 3.75.

Hab.—United States east of Rocky Mountains, north regularly to British Provinces; passes to Mexico and Central America; Cuba (Coues).

"Captain Tolcher, Fifty-sixth Regiment, shot one of these birds early in October, 1854, at Somerset. Mr. Hurdis found it amongst his collection of skins on the 20th of the same month, when Captain Tolcher assured him that Mr. Harford, of his regiment, had killed another specimen about the same time, which, from being very much mutilated, he had unfortunately thrown away." (Nat. in B., p. 27.) A third example, a male in splendid plumage, is in my own collection. I shot it near Hungry Bay on April 28, 1875. The bill and feet of this bird were bright livid blue.

Family CORVIDÆ.

Sub-family CORVINÆ.

Genus Corvus, Linn.

57. ***Corvus americanus***, Aud. American common Crow.
Corvus corone, Wils., Bp., Sw. & Rich., Nutt.
Corvus americanus, Aud., Bp., Nutt., Maxim., Gir., and of authors generally.

Length, 19.00 to 20.00; wing, 13.00 to 13.50; tail, about 8.00.

Hab.—Temperate North America, excepting, probably, most of the high central plains and the Southern Rocky Mountains, where the Raven abounds (Coues). Bermuda (resident).

The early history of this bird, so far as the Bermudas are concerned, is somewhat obscure. In Smith's "History of Virginia" (to which colony Bermuda at one time belonged), date 1623, Crows are mentioned as being numerous in the islands. Colonel Wedderburn says, however (Nat. in B., p. 33): "A few of these birds are generally to be seen between the light-house and Hamilton. I have never found their nests, but they are known to have bred, as a few young Crows were observed near Warwick Church during the first week of April, 1849. It is supposed that they were introduced from Nova Scotia some few years ago." Mr. Hurdis did not, apparently, find the species numerous, for he says (Nat. in B., p. 66): "In August, 1854, eleven of these Crows were observed associating together at Gibbs Hill by the late Colonel Oakley, Fifty-sixth Regiment. This was double the number which had hitherto frequented those parts, and arose, doubtless, from the young of that season." It is somewhat difficult to reconcile the above evidence. Can the species, once numerous, have become extinct, and have then been introduced again? This is possible, but I am inclined to the belief that there have been Crows, more or less, in Bermuda since 1623, their war nature and their partiality for the dense cedar groves causing them t have been but little noticed. However it may be, they are numerous now; so much so that a price has been set on their devoted heads by recent enactment—half-a-crown a bird, and sixpence an egg. That thi is a wise and necessary measure is universally conceded, as they d much damage in the breeding season by destroying young poultry, an the eggs and young of the other resident birds. As is well known, thi species is gregarious, except during the actual time of breeding. A soon as the young are well able to fly the scattered families conso together. I have seen as many as sixteen in one flock in June. Three or four are commonly seen together in winter, when they frequent the rocky shores in search of shell-fish, &c. At the approach of the breeding season they separate into pairs, and select the most retired cedar groves for their nesting places, the same couple resorting to a particular spot for many years if undisturbed. The nest is a bulky structure of sticks and cedar bark, warmly lined with the latter material and with goats' hair; it is usually in a wide fork, against the trunk, and never very high up. Eggs, usually four, exactly like those of our European Crows. I have found as many as half a dozen nests, in various stages of dilapidation, in the same clump of trees—the work, doubtless, of the same pair. They seem invariably to build a fresh one every year. Only one brood appears to be raised, leaving the nest about the end of May. The earliest nest I heard of was one containing four fresh eggs on April 3, 1875. Lieutenant Denison and I found five young birds in one nest, two of which were somewhat less advanced in feathering than the remainder; and, as we were mobbed all the time we were at the nest by *four* old Crows, we came to the conclusion that the nest must be common to both pairs; rather an odd thing when one considers the solitary breeding habits of the species. Mr. Bartram has a specimen measuring 21½ inches in length, which we at first thought must be a Raven, *C. corax*, particularly as it did not mix with the other crows, and was shot on a small island it frequented; but subsequent examination inclined me to believe that it was only an unusually large bird, perhaps a little stretched in stuffing. Ordinary specimens measure 18 to 20 inches.

Suborder CLAMATORES.

Family TYRANNIDÆ.

Sub-family TYRANNINÆ.

Genus TYRANNUS, Cuv.

58. ***Tyrannus carolinensis***, (Gm.) Temm. King-bird; Bee-Martin.

Lanius tyrannus, Linn., Gm., Lath.
Lanius tyrannus, var. *carolinensis et ludovicianus*, Gm., Lath.
Tyrannus carolinensis, Temm., Cab., Bd., and later writers.
Muscicapa rex, Bart.
Muscicapa tyrannus, Wils., Bp., Nutt., Aud.
Tyrannus pipiri, Vieil., Cab., Scl., Gundl., Coues, Scl. & Salv.
Tyrannus intrepidus, Vieil., Sw., Sw. & Rich.; Bp., Woodh., Scl.
Muscicapa animosa, Licht.
Tyrannus leucogaster, Stephens.
Tyrannus vieillotii, Sw.

Length, 8.50; wing, 4.65; tail, 3.70.

Hab.—North America at large, north to 57° or farther, west to Rocky Mountains, beyond which only observed in Washington and Oregon Territories and British Columbia; winters on extreme southern border, and thence into Mexico, Central and South America to Peru; Cuba. (Coues.)

Recorded as very numerous in all the swamps in 1850, but not mentioned as occurring at other times, though Mr. Bartram has one or two specimens of a later date. It would appear to be only a spring visitant. A considerable number appeared in April, 1875, a small band of these attaching themselves to the Devonshire and Hungry Bay district, where several specimens, male and female, were obtained. These were all immature, or rather in winter plumage, with the flame-colored head-patch concealed by black tips to the feathers. Lieutenant Denison observed several at Hungry Bay on the 22d September, 1875, but was unfortunately unable to procure a specimen and thus establish the fact of the species visiting Bermuda on its southward journey.

59. *Tyrannus dominicensis*, Rich. Grey King-bird.

Tyrannus dominicensis, Briss., Rich., Bd.
Lanius tyrannus, var. *β dominicensis*, Gm.
Muscicapa dominicensis, Aud.
Melittarchus dominicensis, Cab.
Tyrannus griseus, Vieil., Sw., Bp., Scl.
Tyrannus matutinus, Vieil.

Length, 8.00; wing, 4.65; tail, 4.00.

Hab.—South Carolina coast, accidental; Florida Keys and West Indies; Nicaragua; New Granada; Cuba; Jamaica. (B. B. & R.)

Only three specimens are on record, viz., one obtained by Colonel Wedderburn in Mr. Hurdis's garden on March 30, 1850, and two others on St. David's Island on April 15, 1850.

Genus CONTOPUS, Cab.

60. *Contopus borealis*, (Sw.) Bd. Olive-sided Flycatcher.

Tyrannus borealis, Sw.
Myiobius borealis, Gray.
Contopus borealis, Bd., and later authors.
Sayornis borealis, Wheat.
Pyrocephalus (*Contopus*) *borealis*, Gray.
Muscicapa inornata, Coop. & Nutt., Nutt.
Muscicapa cooperi, Nutt. Aud., Putn.
Tyrannus cooperi, Bp., Nutt., Reinch.
Tyrannula cooperi, Bp.
Contopus cooperi, Cab.
Contopus mesoleucus, Scl., Sumih.

Length, 7.50; wing, 4.33; tail, 3.30.

Hab.—Entire temperate North America; Mexico; Greenland; rare in Middle and Southern Atlantic States; South to Central America. (Coues.)

Mr. Bartram has one, shot by himself on his farm not many years since.

61. *Contopus virens*, (Linn.) Cab. Wood Pe-wee.

Muscicapa virens, Linn., Gm., Lath., Licht., Bp., Nutt, Aud.
Tyrannula virens, Bp., Woodh.
Myiobius virens, Gray.
Tyrannus virens, Nutt.
Myiarchus virens, Cab., Scl.
Contopus virens, Cab., Scl., Scl. & Salv., Bd., and modern authors.
Pyrocephalus (*Contopus*) *virens*, Gray.
Muscicapa querula, Vieil.
Muscicapa rapax, Wils.

Length, 6.15; wing, 3.50; tail, 3.05.

Hab.—Eastern North America to the borders of the high central plains. Guatemala (?), Mexico, Costa Rica, Texas, Vera Cruz. (B. B. & R.)

A single example was obtained by Mr. Hurdis on April 30, 1852.

Genus Empidonax, Cab.

62. *Empidonax traillii*, (Aud.) Bd. Traill's Flycatcher.

Muscicapa traillii, Aud.
Tyrannula trailli, Rich., Bp., Woodh.
Tyrannus traillii, Nutt.
Myiobius traillii, Gray.
Empidonax traillii, Bd., Cab., Scl., and late writers.
Empidonax pusillus, var. *traillii*, B. B. & R.

Length, nearly 6.00; wing, 2.90; tail, 2.60.

Hab.—Eastern United States and British Provinces, west to the central plains, whence to the Pacific replaced by var. *pusillus;* south to New Granada. (Coues.)

One specimen is in Mr. Bartram's collection, shot at Stocks Point.

Order PICARIÆ.

Sub-order CYPSELI.

Family CAPRIMULGIDÆ.

Sub-family CAPRIMULGINÆ.

Genus CHORDEILES, Sw.

63. *Chordeiles virginianus*, (Gm.) Bp. Night-Hawk.

Caprimulgus virginianus, Briss. (in part), Gm. Lath., Bp., Aud., Nutt.
Caprimulgus (*Chordeiles*) *virginianus*, Sw. & Rich.
Chordeiles virginianus, Bp., Aud., Gir., Woodh., Cass., Brewer, Newb., Scl., Salv., Coues.
Caprimulgus popetue, Vieil., Bp.
Chordeiles popetue Bd., Heerm., Coop. & Suck., Lawr., Hayd., Allen, Coop., Aiken.
Caprimulgus americanus, Wils.

Length, 9.50; wing, 8.20.

Hab.—Entire temperate North and Middle America, north to Hudson's Bay Cuba and Jamaica, migratory; Bahamas; south to Brazil. (Coues.)

I cannot do better than quote from "The Naturalist in Bermuda" the following: "These curious birds are sometimes very common in April, and also in September and October, on their migration north and south. The marsh below Government House was their great resort, when, just as it was getting dusk, they would appear one by one, and soon be skimming about in all directions, uttering every now and then a sharp whirring sort of cry. They double and rush about in a most wonderful manner, frequently depressing first one side, then the other. Although flying close together, they seem to try and keep apart, each having seemingly its own hunting ground" (Wedderburn). "When this bird visits the islands of Bermuda from the north, it invariably appears between the 20th of September and the 11th of October, and on its vernal flight from the south, arrives with wonderful precision between the 23d and 30th of April" (Hurdis). Individuals of this species were observed by officers of Prospect Garrison on February 20 and 28, 1875. It would almost seem probable that these wintered in Bermuda; but the question requires further investigation. They are occasionally picked up dead or in a dying condition. One was found dead in the streets of St. George's on the 26th April, 1875, and a live one was brought to me the same day. The stomachs of several I examined

tober, 1874, contained numbers of the highly-perfumed "green
Rhaphigaster prasinus, so obnoxious to delicate olfactory nerves.
iis good service alone the poor birds should be religiously pro-
l during their short visits.

Family CYPSELIDÆ.

Sub-family CHÆTURINÆ.

Genus CHÆTURA, Steph.

***hœtura pelagica*, (Linn.) Bd.** Chimney Swift.

Hirundo pelagica, Linn.
Chætura pelagica, B. B. & R.
Hirundo pelasgia, Linn., Vieil., Wils.
Cypselus pelasgius, Bp., Nutt., Aud., De Kay, Maxim.
Chætura pelasgia, Steph., Bp., Aud., Bd., and authors generally.
Acanthylis pelasgia, Temm., Woodh., Brewer.

ngth, 5.25; wing, 5.10; tail, 2.15.
ib.—Eastern United States and British Provinces. (Coues.)
ie was shot on the 13th September, 1849. On the 24th of that
th Mr. Hurdis noticed several, left behind after the great flight of
Swallow tribe, already alluded to, had taken its departure. Mr.
ram obtained one in September, 1874, during my residence in the
ids, but I did not meet with the species myself.

Family TROCHILIDÆ.

Genus TROCHILUS, Linn.

***Trochilus colubris*, Linn.** Ruby-throated Humming-bird.

Trochilus colubris, Linn., Lath., Vieil., Wils., Jard., Bp., Sw. & Rich., Nutt., Aud. Gir., and later authors.
Mellisuga colubris, Steph., Gray, Woodh.
Cynanthus colubris, Jard.
Trochilus aureigaster, Lawr.

ength, 3.25; wing, 1.60; tail, 1.25.
lab.—North America, east of Rocky Mountains, north to 57° at least,
th to Brazil; Cuba; winters in Florida (8). (Coues.)
I found the history of this bird's occurrence in Bermuda in a very un-
isfactory state. Colonel Wedderburn writes: "There is a tradition
t the Humming Bird visited the islands of Bermuda in considerable
mbers about thirty years ago; but of late years they have not been
ticed till the 26th April, 1852, when Mr. Hurdis wrote to me, saying
at Mr. John Darrell (son of the attorney-general, now chief justice, of
se islands) had seen a Humming Bird under the windows of his father's

house, where it was busily employed entering the large white bell-shaped flowers of the giant *Stramonium*, its tail only at times being visible. Another was seen about the same time, and within about 2 miles of the same place, by a Miss Watson, in her brother's garden." Referring to the above, Mr. Hurdis says: "My endeavors to ascertain the truth of the tradition alluded to by Colonel Wedderburn ended in disappointment. The bird seen by Mr. Darrell was described to me as greenish in color, with the tail—the only part visible at times—tipped with white. I need not observe that this characteristic appertains to the female." I was, therefore, much pleased to establish its occurrence beyond a doubt, when going through Mr. Bartram's collection with him. He has a genuine female specimen, shot with powdered rice by himself close to his house, his attention having been called to the diminutive stranger by one of his laborers, who thought it was a large moth. Two others were seen at the same time, but not obtained. How these little birds got to Bermuda is a marvel. They have powerful wings for their size, calculated to keep up that humming vibratory motion necessary for their mode of feeding; but one would think that such a long flight across the sea would induce weariness in so small a frame, and leave them at the mercy of the winds and waves.

Family ALCEDINIDÆ.

Genus CERYLE, Boie.

66. *Ceryle alcyon*, (Linn.) Boie. Belted Kingfisher.

> *Alcedo alcyon*, Linn., Gm., Lath., Vieil., Wils., Bp., Sw. & Rich., Aud., Nutt., Gir., Maxim., Trippe.
> *Ceryle alcyon*, Boie., Bp., Gray, and authors generally.
> *Ispida alcyon*, Sw.
> *Megaceryle alcyon*, Reich.
> *Chloroceryle alcyon*, Scl.
> *Alcedo ludoviciana*, Gm.

Length of adult, 12.75; wing, 6.00.

Hab.—Over the waters of all North and Middle America and many of the West Indian Islands; resident or imperfectly migratory, being in the north forced away by the freezing of the waters; accidental in Ireland. (Coues.)

"These birds arrive regularly about the middle of September, and are to be found in all the mangrove swamps, creeks, and ponds in the islands. Many remain during the winter, but they all disappear about the middle of April" (Nat. in B., p. 33). I have seen these birds as late as the 26th

April, and at one time thought they must occasionally remain to breed; but after much careful watching, in which I was assisted by my friends, I came to the conclusion that they all depart, sooner or later, to breed on the North American continent. Hungry Bay is a favorite resort of these fine birds. I have seen six or seven there together, chasing one another, darting at the little fish in the pools, and uttering their harsh, rattling cry. They affect the same hunting grounds, especially those birds that remain for the winter, and day after day, as one drives past the creeks and sheltered bays, one sees the same solemn-looking individual on the accustomed rock or cedar-bough, one eye on the fish in the water below, the other on the passers by.

Sub-order CUCULI.

Family CUCULIDÆ.

Sub-family COCCYGINÆ.

Genus COCCYZUS, Bp.

67. ***Coccyzus erythrophthalmus***, (Wils.) Bp. Black-billed Cuckoo.

Cuculus erythrophthalmus, Wils., Steph., Hart.
Coccyzus erythrophthalmus, Bp., Aud., Gir., Gray, and later writers.
Piaya erythrophthalma, Less.
Erythrophrys erythrophthalmus, Bp.
Coccygus erythropthalmus, Cab., Bd., Hayd., Lawr., B. B. & R.
Coccyzus dominicus, Nutt.

Length, about 12.00; wing, 5.00; tail, 6.50.

Hab.—North America to Rocky Mountains; north to Labrador; south through Mexico and Central America to the Valley of the Amazon; Cuba, rarely; no other Antillean record; said to winter in Florida; accidental in Europe. (Coues.)

The first example recorded was shot by Gibbs early in October, 1874, at the same time as a number of the succeeding species, *C. americanus*, from which its smaller bill, less white on the tips of the tail-feathers, and red ring round the eye, at once distinguish it. Mr. Bartram also obtained a specimen that autumn, and I found two others in his collection, labeled *C. americanus*. I saw one near Devonshire Bay on the 19th April, 1875, and one (probably the same) was brought to me on the 30th of that month from Hungry Bay. Lieutenant Hopegood, of the Ninety-seventh Regiment, shot one of a pair in a potato-field near Devonshire Bay on the 8th May, 1875. I imagine this species has occurred more frequently than the records tend to show, not having been distinguished from its larger-billed congener.

68. *Coccyzus americanus*, (Linn.) Bp. Yellow-billed Cuckoo.

Cuculus dominicensis, Briss. *Cuculus dominicus*, Linn., Lath., Gm.
Coccygus dominicus, Bd.
Piaya dominica, Gray.
Cuculus carolinensis, Briss., Wils.
Erythrophrys carolinensis, Sw.
Cuculus americanus, Linn., Gm., Lath., Steph., Hart.
Coccyzus americanus, Bp., Nutt., Aud., and later authors.
Piaya americana, Less.
Erythrophrys americanus, Bp.
Coccygus americanus, Cab., Bd., Hayd., Coop., Allen, Trippe, B. B. & R.
Coccyzus pyrrhopterus, Vieil.
Cuculus cinereous, Temm.
Coccyzus bairdii, Scl., Gray.

Length, 12.00; wing, 5.95; tail, 635.

Hab.—Eastern United States, to the Missouri plains, California and Nevada, Jamaica, Porto Rico, Costa Rica, Lower Rio Grande. Accidental in Europe, (B. B. & R., Coues.)

A few specimens only are recorded previous to the 9th October, 1849, when an extraordinary invasion took place. Thousands of these birds suddenly appeared in all parts of the islands, most of them departing as suddenly the next day. A few were seen in April, 1852. They were numerous from the 12th to the 15th of October, 1874, and a few remained behind for some time. I shot one near Devonshire Bay, in a potato-field, on the 7th November; its stomach (like that of other specimens examined) was full of green caterpillars collected from the leaves of the potatoes. I was very angry with myself for having killed the poor bird when doing such good service.

Sub-order PICI.

Family PICIDÆ.

Sub-family PICINÆ.

Genus SPHYRAPICUS, Baird.

69. *Sphyrapicus varius*, (Linn.) Bd. Yellow-bellied Woodpecker.

Picus varius, Linn., Gm., Lath., Vieil., Wils., Bp., Wagl., Nutt., Less., Aud., Gray, Reich., Maxim., Scl., Reinh., Sund.
Picus (*Dendrocopus*) *varius*, Sw. & Rich.
Pilumnus varius, Bp.
Sphyrapicus varius, Bd., Malh., Coues, and most late writers.
Sphyropicus varius, Scl. & Salv., Scl., B. B. & R.
Picus (*Sphryrapicus*) *varius*, Gray.
Picus atrothorax, Less.

Length, 8.25; wing, 4.75; tail, 3.30.

Hab.—The typical form in Eastern North America, north, to 61° at ast south to Guatemala, Mexico, Cuba, Bahamas, Greenland. (Coues.)

Of this species Colonel Wedderburn says: "In general not very common. I first saw it in December, 1847 again in November, 1848; and in April 1850, a great many suddenly appeared, several of which I shot. Many of the palmetto trees are bored by this bird. It breeds in Mr. Ballinghall's garden every year, and I should think that a few also breed in holes in the large trees at Brackish Pond, and in some of the other large swamps." Three examples occurred during my stay, but I could not ascertain whether they bred or not in 1875. I don't think they did so in Brackish Pond, where I kept a careful watch for them. Mr. Bartram has about a dozen specimens, scarcely two of which are alike, so variable is the plumage of the species. They are all in immature dress, with the crimson patches more or less replaced by mottled gray, but all possess the characteristic "yellowness" which distinguishes the bird from nearly all the other American *Picidæ*.

Genus COLAPTES, Sw.

70. ***Colaptes auratus*, (Linn.) Sw. Golden-winged Woodpecker; Flicker.**

***Cuculus auratus*, Linn.**
***Picus auratus*. Linn, Forst., Vieil., Wils., Bp., Nutt., Aud.**
***Colaptes auratus*, Sw., Sw. & Rich., Bp., Bd., and most authors.**
***Geopicus auratus*, Malh.**

Length, 12.50; wing 6.00.

***Hab.*—Eastern North America to the slopes and foot-hills of the Rocky Mountains, where in many localities it becomes mixed with *C. mexicanus*; Alaska; Greenland. Accidental in Europe. (Coues.)**

The only specimens ever obtained were shot by officers of the Sixty-first Regiment in Devonshire Marsh, as my friend Mr. J. M. Jones informed me. One or two were shot in 1871, I think, but no others are on record.

Order RAPTORES.

Family STRIGIDÆ.

Sub-family STRIGINÆ.

Genus OTUS, Cuv.

71. ***Otus vulgaris* var. *wilsonianus*, (Less.) Allen. American Long-eared Owl.**

***Otus americanus*. sp., Kaup., Maxun, Allen.**
***Strix peregrinator*, Bartr.**
***Asio peregrinator*, Strickland.**
***Strix otus*, Wils., Bp., Nutt., Aud. Peal.**
***Strix* (*Asio*) *otus*, Sw. & Rich.**

Otus wilsonianus, Less., Cass., Brew., Bd., Cooper, Coues, Hayd.
Otus vulgaris, Jard., Aud., Gir.
Otus vulgarus americanus, Schl.
Otus vulgaris var. *wilsonianus*, Allen, Coues, B. B. & R.

Female: Length, about 15.00; wing, 11 to 11½; tail, 6.

Male, rather smaller.

Hab.—Whole of the temperate North America? (B. B. & R.)

This near ally of our European *O. vulgaris* has occurred frequently, but irregularly, during the winter months, generally on the highest part of the islands, near the light-house. One in Mr. Bartram's collection was caught alive at Mount Langton a few years ago. This bird did not, to my knowledge, visit Bermuda during the year 1874–'75.

Genus BRACHYOTUS, Gould.

72. *Brachyotus palustris*, (Bechst.) Gould. Short-eared Owl.

Strix brachyotus, Gm., Lath., Daud., Bechst., Shaw, Temm., Mey., Vieil., Roux, Brewer, Yarr., Penn., Morris, Wils., Bp., Nutt., Aud.
Otus brachyotus, Aud., Jard., Gir., Cass., Reinh., Allen, Boie, Steph., Naum., Eyt., Schl., Gray, Cuv., Less., Sw., Bp., Selby, Mont., Kaup.
Asio brachyotus, Macgil., Strickl.
Ulula brachyotus, Macgil.
Strix accipitrina, Pall., Gm., Daud.
Asio ulula, Less.
Otus ulula, Cuv.
Strix palustris, Bechst., Lath., Shaw, Mey.
Otus palustris, DeKay, Gould, Brehm.
Brachyotus palustris, Bp., Coues, Gould.
Strix brachyura, Nilss.
Strix caspia, Shaw.
Brachyotus galapagoensis, Gould.
Otus galapagoensis, Darw., Bp., Gray.
Asio galapagoensis, Strickl.

Female: Length, about 15 inches; wing, 12; tail, 6.

Male rather smaller.

Hab.—Europe, Asia, Greenland, America, West Indies. (Coues.)

Not so frequent a visitor as the preceding; but, like it, appearing in the autumn and winter months, and usually seen on the south side, near the light-house. The attraction presented by that part of the islands would appear to consist of a plentiful supply of mice, which inhabit the sandy scrub-covered hills near the shore. Mr. Bartram has two specimens of this Owl, and I obtained two myself during my stay—one at the Sand Hills, and another in Warwick Swamp.

Sub-family SYRNINÆ.

Genus SYRNIUM, Sav.

3. ***Syrnium nebulosum***, (Forst.) (Boie). Barred Owl.

Strix nebulosa, Forst., Gm., Lath., Daud., Vieil., Wils., Jard., Bp., Sw. & Rich., Nutt., Aud., DeKay.
Syrnium nebulosum, Boie, Gray, Gould, Aud., Cass., and later United States authors.
Ulula nebulosa, Steph., Cuv., Less., Bp., Schl.
Strix chichictli, Gm.
Strix varius, Bart.
Strix fernandica, Shaw.

Length, about 20.00; wing, 13.00 to 14.00; tail, 9.00.

Sexes nearly of the same size.

Hab.—North America, east of the Rocky Mountains, chiefly United States. (Coues.)

Mr. Hurdis observed one of these birds on the 2d April, 1851.

Genus NYCTALE, Brehm.

74. *Nyctale acadica* (Gm.) Bp. Saw-whet Owl.

Strix acadica, Gm., Daud., Vieil., Bp., Sw. & Rich., Jard., Nutt., Aud., DeKay.
Nyctale acadica. Bp., Gray, Kaup, Strickl., Cass., Brewer, Scl., and later authors.
Nyctala acadica, Gray.
Scotophilus acadicus, Sw.
Noctua acadica, Rich.
Ulula acadica, Aud., Putn., Schl.
Strix acadiensis, Lath., Shaw.
Strix albifrons, Shaw., Lath.
Bubo albifrons, Vieil.
Scops albifrons, Steph.
Nyctala albifrons, Cass., Coues, Coop., Verr.
Nyctata albifrons, Gray.
Strix phalaenoides, Daud., Lath., Vieil., Shaw.
Athene wilsoni, Boie.

Total length, 7½ to 8 inches; wing, 5½; tail, 2¾ to 3.

Sexes nearly the same size.

Hab.—Temperate North America from Atlantic to Pacific, chiefly, however, northern United States and adjoining British territory ranging southward in woody, mountainous regions into Mexico. Oaxaca. (Coues.)

A rare straggler. Colonel Wedderburn's notes contain all the information we possess. He says (Nat. in B. p. 25): "Only one specimen, found on the 12th January, 1849, sitting inside the muzzle of one of the guns at Ireland Island by an artilleryman. It is to be hoped that the said gunner has more nerve when working a gun than he displayed on finding the little bird, being afraid to catch it, as, he said, 'it glow'red at him.' It was caught by a man of the Forty-second, and lived in my room for several days, getting quite tame. At night it always became restless, and finally killed itself against the wires of the cage. Mr. Harry Tucker saw another some short time afterwards, in a cave on the south shore."

Sub-family NYCTEININÆ.

Genus NYCTEA, Steph.

75. *Nyctea scandiaca*., (Linn.) Newton. Snowy Owl.

Strix scandiaca, Linn.
Nyctea scandiaca, Newt., Dress.
Nyctea scandiaca, var *arctica*, Ridg., B. B. & R.
Strix nyctea, Linn., Briss., Brünn., Forst., Gm., Lath., Daud., Vieil., Pall., Wils., Bp., Temm., Nutt., Aud., &c.
Noctua nyctea, Cuv., Boie., Less., Brehm., Schl.
Surnia nyctea, Selby, Gould, Jard., Keys. & Blas., Aud., Gir., Putn., Kaup.
Syrnia nyctea, Macgil., Jard., Watt.
Strix nivea, Thumb., Daud.
Noctua nivea, Brehm.
Nyctea nivea, Gray, Bp., Cass., Brewer, Bd., and many later authors.
Strix bubo, var. *albus*, Daud.
Strix candida, Lath.
Nyctia candida, Sw.
Strix erminea, Shaw.

Total length, 24 to 27 inches; wing, 16 to 17; tail, 10.

Hab.—Northern regions of both continents, migrating southward in winter. Resident in Canada, Bermuda, South Carolina, Kentucky. (Baird.)

Colonel Wedderburn observes (Nat. in B., p. 25): Lieutenant Fayrer, royal navy, shot two specimens at Boss's Cove in the autumn of 1843. Another, a fine female specimen, was shot by a person named Llewellyn, at Ireland Island, on the 29th November, 1853. This bird was only wounded, and when examined by Mr. Hurdis, on the 13th December following, appeared lively and well. When being fed, it frequently erected a little tuft of feathers on each side of the head, so as to resemble small horns. Two frequented the islands in the autumn of 1875; one of these was shot by Lieutenant Tallents, Twentieth Regiment, the other escaped, though it remained two months or more.

Genus SURNIA, Duméril.

76. ***Surnia ulula*, var. *hudsonia*, (Gm.) Coues. American Hawk Owl.**

Strix freti hudsonis, Briss.
Strix hudsonia, Gm., Wils, Shaw, Vieil.
Surnia hudsonia, James.
Surnia ulula var. *hudsonia*, Coues.
Strix canadensis, Briss., Shaw.
Strix funerea, Sw. & Rich., Aud., Bp., Brewer, Peab.
Surnia ulula, Cass., Gray, Lord, Kaup, Dall & Baun., Mayn.

Female: Length, 16 to 17 inches; wing, 9; tail, 7.

Male: Rather smaller.

Hab.—Arctic America, south in winter into Northern United States. Wisconsin, Massachusetts, Dakota, and Montana. (B. B. & R.)

A single specimen was "seen by Col. Drummond, at St. George's, quite close to him, on a Sunday afternoon, otherwise it would have been shot" (Nat. in B., p. 55).

Family FALCONIDÆ.

Sub-family MILVINÆ.

Genus CIRCUS, Lacépède.

77. ***Circus cyaneus*, var. *hudsonius*, (Linn.) Schl. Marsh Hawk; American Harrier.**

Falco hudsonius, Linn., Gm., Lath., Daud.
Circus hudsonius, Vieil, Cass., Heerm., Strickl., Coues, Blakist.
Circus cyaneus hudsonius, Schl.
Circus cyaneus, var. *hudsonius*, Coues, Gray.
Strigiceps hudsonius, Bp.
Falco spadiceus, Gm., Forst.
Falco uliginosus, Gm., Lath., Daud., Wils., Sab.
Circus uliginosus, Keil., DeKay, Max.
Strigiceps uliginosus, Bp. Kaup.
Falco cyaneus, Aud., Bp.
Circus cyaneus, Bp., Jard., Sw. & Rich., Aud., Brewer, Nutt., Gir., Gray.

Female: Length, 19 to 21; wing, 15½; tail, 10.

Male: Length, 16 to 18; wing, 14½; tail, 8½ to 9.

Hab.—Entire continent of North America; south to Panama, Cuba, Bahamas. (B. B. & R.)

This species is occasionally seen in Bermuda in the autumn. One was shot by Mr. Pooley, Twentieth Regiment, in 1845, and one by Mr. Hurdis in December, 1851. Mr. Bartram has a male and two female specimens. As might have been expected, he was somewhat unwilling to believe that they were of the same species. A female was picked up dead in Warwick Parish in November, 1874, by a "colored" boy, who showed it to me too late for preservation, unfortunately.

Subfamily ACCIPITRINÆ.

Genus ACCIPITER, Briss.

78. ***Accipiter fuscus*****, (Gm.) Gray. Sharp-shinned Hawk.**

Falco fuscus, Gm., Lath., Daud., Bp., Nutt., Aud., Brewer.
Accipiter fuscus, Bp., Cass., Bd., Scl., and most late authors.
Astur fuscus, Aud., DeKay, Gir.
Nisus fuscus, Kaup., Finsch., B. B. & R.
Falco dubius, Gm., Lath., Daud.
Accipiter striatus, Vieil.
Falco velox, Wils., Bp.
Accipiter velox, Vig., Steph.
Falco pennsylvanicus, Wils.
Nisus pennsylvanicus, Cuv.
Accipiter pennsylvanicus, Vig., Steph., Sw. & Rich., Jard., Sw.
Sparvius lineatus, Vieil.
Accipiter ardosiacus, Vieil.

Female: Length, 12 to 14; wing, 7½ to 8; tail, 6½ to 7.

Male: Length, 10 to 11; wing, 6 to 6½; tail, 5 to 5½.

Hab.—The whole of North America; south to Panama. Bahamas (B. B. & R.)

Colonel Wedderburn has a specimen in his collection, shot near Peniston's Pond on the 23d February, 1853, and Mr. Bartram has another, shot by himself near Stock's Point.

Genus ASTUR, Lacépède.

79. ***Astur atricapillus*****, (Wils.) Jard. American Goshawk.**

Falco atricapillus, Wils., Wag , Nutt.
Hierofalco atricapillus, Cuv.
Sparvius atricapillus, Vieil.
Astur atricapillus, Jard. & Selby, Bp., Kaup., Cass., and late authors.
Falco palumbarius, Bp., Aud.
Accipiter palumbarius, Sw. & Rich.
Astur palumbarius, Aud., Gir.
Astur palumbarius, var. *atricapillus*, Ridg., B. B. & R.
Falco regalis, Temm.
Dædalion pictum, Less.

Female: Length, 22 to 24; wing, about 14; tail, 10½ to 11.

Male: Length about 20; wing, 12½; tail, 9½.

Hab.—North America, chiefly in the northwestern portions. (Baird

I examined two specimens in Mr. Bartram's collection, the only one that have occurred. One is a fine adult, shot on Somerset Island som twelve years since; the other is in immature plumage, with the clos barring of the under parts only just commencing to appear on the thighs

Length: Female, 12 to 14; male, 10 to 11 inches. Wing: female, 8 to 9; male, 7½ to 8. Tail: female, 5 to 5½; male, 5.

Hab.—Temperate North America, Mexico, Central America, Northern South America, Cuba, Jamaica, Bermuda, Ecuador, Venezuela.

A frequent visitor, always in the autumn and winter months. Hardly a year passes without a few stragglers appearing. I saw one flying over Devonshire Swamp on the 2d November, and obtained a beautiful male from the same place on the 3d December, 1874.

Sub-genus TINNUNCULUS, Vieil.

82. *Falco sparverius*, Linn. American Sparrow-Hawk.

Falco sparverius, Linn, Gm., Lath., Daud., Wils., Cuv., Jard., Brewer, Bp., Sw. & Rich., Nutt., Aud., Vieil., and late authors.
Falco (*Tinnunculus*) *sparverius*, of some authors, Ridg., B. B. & R.
Tinnunculus sparverius, Vieil, Gray, Bp., Cass, Coues, and many authors.
Cerchneis sparverius, Boie, Bp.
Pœcilonis sparverius, Kaup.

Length, 11 to 12; wing, 7 to 7½; tail, 5 to 5½.

Hab.—The whole of North America and southward (Coues).

Only one recorded, shot near the Sluice Ponds on the 9th December, 1853, while in the act of pouncing on some chickens (Nat. in B., p. 24).

Sub-family BUTEONINÆ.

Genus BUTEO, Cuv.

83. *Buteo borealis*, (Gm.) Vieil. Eastern Red-tailed Buzzard; Hen-Hawk.

Falco borealis, Gm., Lath., Daud., Wils., Sabine, Bp., Wagl., Nutt., Aud.
Buteo borealis, Vieil, Sw. & Rich., Vig., Less., Jard., Brewer, Bp., Aud., Gosse, Cass., and late authors.
Astur borealis, Cuv., Sw.
Pœcilopternis borealis, Kaup.
Buteo (*Craxirex*) *borealis*, Gray.
Falco leverianus, Gm., Lath, Daud., Shaw, Wils.
Falco jamaicensis, Gm.
Buteo ferrugineicaudus, Vieil, Cuv.
Accipiter ruficaudus, Vieil.
Buteo fulvus, Vieil.
Buteo americanus, Vieil.

Female: Length, 22 to 24; wing, 15 to 16; tail, 8½. Male: Length, 19 to 21; wing, 14; tail, 7½ to 8.

Hab.—Whole of North America, Mexico, Cuba, Jamaica (Coues).

Mr. Bartram has one specimen, an adult, with fine chestnut tail, shot at Baylis's Bay, about twelve years ago, by a man named Hollis, who is still residing in the islands, the same who shot the two Peregrine

Falcons alluded to in the notes on that species. About the same time a nest of this buzzard containing young is said to have been found in the cliffs of Harrington Sound, but what became of this nest and its occupants history saith not. I see no reason to doubt the story, especially as it is corroborated by an authentic specimen of the bird; but I unfortunately did not see the man Hollis, as I meant to have done. Large hawks are mentioned as common in Bermuda by the old historians, and this species may have once been resident and numerous. The high cliffs on the north side of Harrington Sound offer great attractions to raptorial birds, in default of large timber, for nesting, and this species is known to breed in Jamaica (Gosse, B. of Jamaica, p. 14).

Genus ARCHIBUTEO, Brehm.

84. ***Archibuteo lagopus***, var. *sancti-johannis*, (Gm.) Ridg. American Rough-legged Buzzard.

Falco Sancti-Johannis, Penn., Gm., Lath., Daud., Shaw, Bp., Aud., Gir.
Butes Sancti-Johannis, Jard., Nutt., De Kay.
Butaëtes Sancti-Johannis, Cuv., Bp.
Archibuteo Sancti-Johannis, Gray, Bp., Cass., Kaup., Strickl., Brewer.
Falco spadiceus, Gm., Latti, Daud.
Butes spadiceus, Vieil.
Falco lagopus, Wils., Brewer, Bp., Aud.
Buteo lagopus, Rich., Aud., Jard., Nutt.
Archibuteo lagopus, Cass., Brewer, Coop. & Luck., Coues.
Falco niger, Wils., Lath.
Buteo niger, Steph., Vig., Cuv.
Buteo ater, Vieil.

Female: Length, 22 to 24; wing, 17 to 17½; tail, 9.

Male: Length, 20 to 22; wing, 16 to 16½; tail, 8 to 8½.

Hab.—Typical *lagopus*, European. Var. *Sancti-Johannis*, in North America at large, rather northerly; the melanoticcondition chiefly observed in the Middle Atlantic States, New England, and northward (Coues).

A dingy old specimen in Mr. Bartram's possession, covered with dust and cobwebs, and with all the quills and tail-feathers nibbled off short by rats, appears to belong here. Its measurements and fully-feathered tarsi are, I think, unmistakable. The bird was originally dubbed an "Eagle." It was shot near Prospect Camp by a medical gentleman, who gave it to Mr. Bartram.

Sub-family AQUILINÆ.

Genus PANDION, Savigny.

85. ***Pandion haliaëtus*, (Linn.) Cuv. Osprey.**

Aquila haliætus, Briss., Mey., Jen.
Falco haliaëtus, Linn.. Gm., Lath., Daud., Shaw, Temm., Wils., Bp., Nutt., Aud., Gir., Naum.
Accipiter haliætus, Pall.
Pandion haliætus, Cuv., Less., Steph., Sw., Kaup, Eyton, Bp., Keys & Blas., Schl., Gray, Strickl., Coues, and of authors.
Falco arundinaceus, *cayanensis*, *carolinensis*, Gm., Daud.
Pandion carolinensis, Bp., De Kay, Strickl., Cass., Brewer, Heerm., Coop. & Suck., Lord, Coues, Dall & Bann., Coop., and most late U. S. authors.
Pandion haliætus, var. *carolinensis*, Ridg., B. B. & R.
Pandion fluvialis, Savi., Less., Vieil., Degl., Roux, Baill., Puch.
Pandion americanus, Vieil., Sw., Vig.
Pandion indicus, Hodgss.
Pandion leucocephalus, Gould, Gray, Bp., Strickl.
Pandion haliætus, var. *leucocephalus*, Ridg., B. B. & R.

Female: Length about 25 inches; wing, 21; tail, 10½.

Male rather smaller.

Hab.—Cosmopolitan. American and Australian, respectively, under the names of *P. carolinensis* and *P. leucocephalus*, have been currently regarded as distinct races or species (Coues).

The movements of this cosmopolitan species in Bermuda are somewhat mysterious. In 1874 I saw the first on April 22; in 1875, one was observed on the 17th of that month. During May they are often to be seen, especially about the Great Sound, along the south shore, and at Peniston's Pond, but whether these are old or young birds I cannot say, as I religiously abstained from shooting one. During the summer months I lost sight of them, though I believe they were occasionally observed, but in autumn I met with one or two specimens. On May 2, 1875, I watched for some time two of these fine birds circling over Devonshire Swamp. This gave rise to the question, "Do they breed here?" I took eggs in Southern Spain, slightly incubated, on March 29; and there being but little difference of latitude between the two places, it would be only natural to suppose that if they were going to nest in Bermuda they would have arrived earlier. Probably, therefore, they are young birds from early nests on the mainland. They are said by Newton to be found on the island of St. Croix at all times except during the breeding season, and the same remark doubtless applies to Bermuda. I could hear nothing of nests in former years. I must leave the question to be solved by future visitors to the islands.

Genus HALIAËTUS, Savigny.

86. *Haliaetus leucocephalus*, (Linn.) Sav. White-headed Eagle; Bald Eagle.

Aquila leucocephalus, Briss., Vieil., Pall., Sw.
Falco leucocephalus, Linn., Gm., Lath., Shaw, Wils., Bp., Nutt., Aud., Brewer.
Haliaëtus leucocephalus, Savig., Cuv., Less., Steph., Bp., Aud., Gir., Gray, Cass., Brewer, and of authors generally.
Aquila (*haliaëtus*) *leucocephalus*, Sw. & Rich.
Falco pygargus, Daud.
Falco ossifragus, Wils.
Falco washingtonii, Aud., Nutt., Brewer, James.
Haliaëtus washingtonii, Bp., Aud., Cass.

Female: Length, 35 to 40; wing, 23 to 25; tail, 14 to 15.

Male: Length, 30 to 34; wing, 20 to 22; tail, 13 to 14.

Hab.—The whole of North America; Greenland (Coues).

This fine bird was seen by Mr. Hurdis, in Hamilton Harbor, on the 8th June, 1853, and an undoubted adult example was frequently observed in Pembroke Marsh and other places between the 2d and 11th March, 1854. Mr. Bartram informs me that he came upon one perched on an old turret of the Castle, at the entrance of Castle Harbor, on the 1st May, 1877. He at first thought it was an osprey, but soon noticed the white head and neck of the Eagle. He had no gun with him at the time. Again, on the 10th October, 1878, he was told of a strange bird on a tree near his house, and on proceeding to the spot "it flew past me quite low, and slow, not more than twenty or thirty yards from me, and I was so much occupied in taking stock of it that I never once thought of pulling the trigger until it was out of reach. Its head and neck were clear white; all the other parts dark-brown." In a subsequent paragraph of his letter he adds: "I have just (14th October, 1878) got word that one of my gunners was after the Eagle on Longbird Island this afternoon, but a carriage came along and scared it away. I hope that some of us will get a chance yet." As I have not since heard from Mr. Bartram, I am unable to state anything definite regarding the capture of the bold stranger, and the White-headed Eagle must still be included in the Bermuda lists as "seen but not obtained." Nevertheless, the evidence is so very strong and clear that I have not hesitated to give a place to the species in this work.

Mr. Bartram writes, under date 9th December, 1878, that this fortunate bird made good his escape after all. (S. G. R.)

Family CATHARTIDÆ.

Genus CATHARTES, Ill.

87. *Cathartes aura*, (Linn.) Ill. Turkey-buzzard.

Vultur aura, Linn., Gm., Lath., Bartr., Vieil., Wils., Licht., Aud., Darwin, Wagl.
Cathartes aura, Ill., Cuv., Vig., Less., Bp., Jard., Sw. & Rich., Nutt., Sw., Aud., d'Orbig., and authors generally.
Catharista aura, Viel., Gray.
Percnopterus aura, Steph.
Rhinogryphus aura, Ridg., B. B. & R.
Vultur aura β, Lath.
Vultur iota, Molina, Gm., Daud.
Cathartes iota, Auct.

Length, 30; wing, 23; tail, 12.

Hab.—All of North America, except the Arctic Regions (Baird).

A male of this ill-favored species appeared during the yellow-fever epidemic of 1853. Was its coming accidental, or did some marvelous instinct lead it there? It was shot in the latter part of November, and subsequently examined by Mr. Hurdis.

Order COLUMBÆ.

Family COLUMBIDÆ.

Sub-family COLUMBINÆ.

Genus ECTOPISTES, Sw.

88. *Ectopistes migratoria*, (Linn.) Sw. Passenger Pigeon.

Columba canadensis, Linn., Gm.
Columba migratoria, Linn., Gm., Forst., Wils., Bp., Nutt., Aud.
Ectopistes migratoria, Sw., Bp., Reich., Aud., and late writers.
Peristera migratoria, Schl.

Length, 17; wing, 8.50; tail, 8.40.

Hab.—The greater part of North America, but scarcely west of Rocky Mountains; Cuba; accidental in Europe (Coues).

Colonel Wedderburn records that one was seen by Dr. Cole; but no date is given. Mr. Bartram shot one as he lay on a sofa in his museum with "broken-bone" fever, on October 24, 1863; it was sitting on a tree close to his house. My friend Mr. J. M. Jones was informed by Mr. J. H. Trott that, previous to 1831, small parties of these birds were resident in the islands, breeding in the caves at Walsingham, and along outh shore; but I am inclined to think, with all deference to the ority given, that these must have been escaped "Blue Rocks" from cotes in the islands.

Subfamily ZENAIDINÆ.

Genus ZENAIDURA, Bp.

Zenaidura carolinensis, (Linn.) Bp. Carolina Dove.

Columba carolinensis, Linn., Gm., Lath., Wils., Bp., Nutt., Aud.
Ectopistes carolinensis, Rich., Bp., Aud., Heerm.
Zenaidura carolinensis, Bp., Bd., Scl., Coop. & Luck., Hayd., Coues, Dress., Allen, Lawr., Coop.
Perissura carolinensis, Cab.
Peristera carolinensis, Schl.
Columba marginata, Linn., Gm., Wag.
Ectopistes marginata, Gray.
Zenaidura marginellus, Bp.

Length, 12.85; wing, 5.75; tail, 6.70.

Hab.—United States, from Atlantic to Pacific; Canada West; Cuba; south to Panama (Coues).

Specimens are recorded in The Naturalist in Bermuda. One was shot by Captain Harvey on March 20, 1850, and another was taken alive at Spanish Point on October 30, 1854. I saw one at the Sand Hills on November 5, 1874. A small flock frequented the fields near Whale Bay all through the winter of 1874–'5, and specimens were obtained, one by Lieutenant Hussey, Royal Engineer, on February 11, 1875. I hear from Lieutenant Denison that two were seen as late as June 20, 1875. Can they have remained to breed? These pretty birds are fond of associating with the next species, feeding with them on the newly-turned fields, conspicuous, when the flock is disturbed, by their larger size and long tails. Their flight is very strong and rapid.

Genus CHAMÆPELIA, Sw.

90. _Chamæpelia passerina_, (Linn.) Sw. Ground Dove.

Columba passerina, Linn., Lath., Wils., Wag., Aud., Lund.
Columba (Goura) passerina, Bp., Nutt.
Chamæpelia passerina, Sw.
Chamæpelia passerina, Bp., Gosse, Bd., Scl., Cab., Lawr., Coop.
Chamæpelia granatina, Bp.
Chamæpelia albivita, Bp.

Length, 6.30; wing, 3.50; tail, 2.80.

Hab.—South Atlantic and Gulf coasts; accidental near Washington; Lower California, West Indies, New Granada, Venezuela, Bermuda (Baird).

[illegible] f abundant. It nests twice, laying two white eggs, ·85 inch [illegible] th, in a small, flimsy construction of twigs and cedar bark, a [illegible] placed on the bushy horizontal bough of a cedar tree, from [illegible] to twenty feet above the ground. The earliest eggs I saw w[illegible] pril 4, the latest on June 27; but there are instances of its bee[illegible] en in the winter months. When disturbed from its nest it falls [illegible] ne to the ground, where it commences to flutter about, as if in the [illegible] nies of death, to deceive the intruder. Should the latter be taken in by the good acting of the poor little bird, and attempt to seize her, she shuffles away along the ground just out of reach, farther and farther from her nest, and when she thinks her home is safe, away she dashes into the trees wi[illegible] "whir-r-r-r" of relief. My terrier used to be completely "sold" in this way, and had many an exciting but fruitless chase after the little doves. The "colored" people have an absurd superstition about this bird, [illegible]nd say that when it utters its "*coo-oop*" (this is an extraordinarily loud and sonorous call for so small a bird, and can be heard a long distance), it is scratching up the ground for somebody's grave! The habits and mode of feeding of the species are too well known to need description. The male is larger, and has the sides of the neck and the under [illegible]arts of a much warmer purplish red than the female.

Order GALLINÆ.

Family PERDICIDÆ.

Sub-family ORTYGINÆ.

Genus Ortyx, Steph.

91. ***Ortyx virginianus*, (Linn.) Bp. Virginian Partridge or Quail.**

Tetrao virginianus, Linn., Gm.
Perdix virginiana, Lath., Wils., Bp., Aud.
Ortyx virginianus, Jard., Bp., Aud., Gould, Bd., and late authors.
Tetrao marilandicus, Linn., Gm.
Perdix marilandica, Lath.
Perdix borealis, Vieil.
Ortyx borealis, Steph., Jard., & Selby.
Ortyx castaneus, Gould.

Length, 10.00; wing, 4.70; tail, 2.85.

Hab.—Eastern United States to the high central plains (Baird).

This bird (known to English sportsmen as a comparatively recent introduction, under the name of Virginian "Colin") is *the* gamebird of Bermuda; but whether it originally found its way there from the Amer-can continent without the agency of man is doubtful. It is not mentioned by the old historians. It is certain, however, that, though common some few years previous to 1840, it became extinct in the islands from that year till 1858 or 1859, when, thanks to the enterprise of Mr. Richard Darrell, an importation took place from the United States. Several pairs were turned out, and these, increasing rapidly, soon spread over the islands to such an extent that the species may now once more be considered common. The manners and customs of this handsome bird are too well known for me to venture on details. From my notes, however, I extract the following, which may prove of interest: It is extremely prolific. Mr. Samuel Harvey told me of a nest near his garden containing eighteen eggs, every one of which hatched off; there are seldom less than twelve eggs in a nest; they sit in the cedar trees on wet days, and during the mid-day heat, roosting there at night. When once flushed they are very hard to put up a second time, even with good dogs, being able, according to popular superstition, to conceal their scent at will; they run rapidly, and squat closely in the thick sage-bush, the strong smell of which is calculated to puzzle a dog. Their call note is triple, "hoo-woo-wooit," the "hoo" indistinct and audible for a short distance only. I don't think "Bob White," the familiar American name, fairly represents the call; it is too sharp and well defined. These birds are fond of the ripe berries of the sage and cedar; the latter give the flesh a decidedly unpleasant aromatic flavor. They also eat the sweet potatoes in small pieces. Great numbers of the young are destroyed by the swarm of cats which infest the islands. An old "colored" lady once accosted a gallant officer of the Fifty-third Regiment, who was beating some likely ground near her cottage, and asked him what he was looking for. "Partridges!" cried she, with a sneer on her sable features, "*I* don't want a gun to get them. Why! my cat brings me in one every morning!" Cats, however, are not the only foes to be dreaded. The "colored" sportsmen take the eggs and eat them, while a white "sportsman" resident on the islands was once overheard to say, "It's all very well for the officers; they get lots of practice—can shoot Partridges at any time—but the only time I can get them is when they have nests, and I can kill the old birds." No wonder the poor birds are kept down, and increase with lamentable slowness. If it were not that they are so hard to put up and shoot in a workmanlike manner (two brace being quite a "bag" in one day), their extermination would be a matter of a few years only.

Order GRALLATORES.

Sub-order LIMICOLÆ.

Family CHARADRIIDÆ.

Sub-family CHARADRIINÆ.

Genus SQUATAROLA, Cuv.

92. *Squatarola helvetica*, (Linn.) Brehm. **Black-bellied Plover; Gray Plover.**

Tringa helvetica, Linn., Forst.
Squatarola helvetica, Brehm., Bp., Gray, and of most late authors.
Vanellus helreticus, Vieil.
Charadrius helveticus, Licht., Bp., Nutt., Aud.
Tringa varia, Linn.
Charadrius varius, Finsch & Hartl.
Pluvialis varius, Schl., Degl. & Gerbe.
Tringa squatarola, Linn.
Charadrius squatarola, Naum.
Vanellus squatarola, Schl.
Vanellus melanogaster, Bech., Temm., Sab., Rich., Sw. & Rich.
Squatarola australis, Bp.

Length, 11.50; wing, 7.50; tail, 3.00.

Hab.—Nearly cosmopolitan.

Unlike the next species, this is by no means a frequent visitor to the Bermudas. One was killed and another seen by Colonel Wedderburn at Mangrove Bay in September, 1848. I shot one on the beach below the Sand-hills on the 5th, and another near Warwick Camp on the 13th November, 1874. Both these birds were alone.

Genus CHARADRIUS, Linn.

93. *Charadrius fulvus*, var. *virginicus*, (Bork.) Coues. **American Golden Plover.**

Charadrius dominicus, Müller, Cass.
Charadrius pluvialis, Wils., Sab., Bp., Sw. & Rich., Nutt., Aud.
Charadrius pluvialis, var. *virginicus*, Ridg.
Charadrius virginicus, Bork., Licht., Bd., Coop. & Luck., Hayd., Dress., Reinh., Stev., Snow, Trippe, and of nearly all late local lists.
Pluvialis virginicus, Bp.
Charadrius marmoratus, Wag., Aud., Putn.
Pluvialis fulvus americanus, Schl.
Charadrius fulvus, var. *virginicus*, Coues.

Length, 9.50; wing, 7.00; tail, 2.50.

Hab.—All of North America; Greenland; accidental in Europe. (Coues.)

Dr. Coues is of opinion that the American bird cannot be specifically separated from the Asiatic *C. fulvus* (an undoubted specimen of which has been recently obtained in the Prybilov Islands). It can always be distinguished from our European *C. pluvialis* by its gray axillaries. An excellent account of the appearances of this species in Bermuda is given by Mr. Hurdis (Nat. in B., pp. 71–77), who goes carefully and thoroughly into the question of its wonderful migrations. Colonel Wedderburn says (p. 36): "During some years large flocks of these birds pass over the islands in the months of September and October; but, unless in stormy weather, they do not alight in any great numbers. I have seen it as early as the 21st August, 1847, at Ireland Island; again, on the 25th July, 1848, at Hamilton. The latter was a single bird sitting on the road close to the house in which I lived, but by the time I got out it was gone. On the 9th March, 1852, one was shot in beautiful plumage, on the north shore; and this is the only instance of its appearing in spring." Numbers appeared in September, 1874, frequenting the grassy slopes of the north shore—their favorite haunt—and even the parade grounds, during the continuance of a three days' revolving gale. Many were shot, all in the mottled dress which procured for the species the specific name "*marmoratus*." Small flocks continued to arrive at intervals during the autumn, remaining only a few days in each case. I obtained specimens on the 14th and 23d November in complete winter dress. The arrival of the Golden Plover in August or September is the beginning of the shooting season in Bermuda, and is eagerly looked for by the British officer, who forgets all the heat and discomfort of the summer in the pleasure of once again handling his gun and cartridges. And a nicely-cooked Golden Plover for breakfast is by no means to be despised, as those who have been trifling with tough fowls and doubtful eggs for months can well testify. The note of this species differs from that of *C. pluvialis;* it sounds like "wee-o-wee," sharply but clearly pronounced.

Genus ÆGIALITIS, Boie.

94. *Ægialitis vociferus*, (Linn.) Bp. Kildeer Plover.

***Charadrius vociferus*, Linn., Gm., Lath., Wils., Bp., Sw. & Rich., Nutt., Aud. Schl., and of earlier authors generally.**

***Ægialitis vociferus*, Bp., Cab., Scl., Coop. & Suck., Dress., Lawr., and of most later writers.**

***Oxyechus vociferus*, Reich.**

***Charadrius torquatus*, Linn.**

***Charadrius jamaicensis*, Gm.**

Length, about 9.50; wing, 6.50; tail, 3.50.

Hab.—All of temperate North America; West Indies; Central and South America in winter; accidental in Europe. (Coues.)

The latest of the southward migrants, but regular in its visits. First seen about the middle of November, in small flocks, which remain till February, attaching themselves principally to the grassy bottoms and moist places on the south side. Persons living on this side hear their sweet wild note all night. A few remain till March or even later.

95. ***Ægialitis semipalmatus***, (Bp.) Cab. Semipalmated or Ring Plover.

Tringa hiaticula, Wils.
Charadrius hiaticula, Ord., Sab., Rich.
Charadrius (*Ægialitis*) *hiaticula* var. *semipalmatus*, Ridg.
Charadrius semipalmatus, Bp., Kaup., Wagl., Sw. & Rich., Nutt., Aud., Schl., Gray.
Ægialitis semipalmatus, Bp., Cab., Bd., Coop. & Suck., Coues, Dress., Dall & Bann., Mayn., Allen.
Ægialeus semipalmatus, Reich., Allen.

Length, about 7.00; wing, 4.75; tail, 2.25.

Hab.—Continent of North America, breeding chiefly in higher latitudes, wintering from our southern border to Brazil. (Coues.)

Arrives in small numbers early in August, with the annual invading army of Stints and Sandpipers, remaining till October, and frequenting the sandy bays on the south shore, also the muddy edges of Peniston's Pond.

96. *Ægialitis melodus*, (Ord.) Bp. Piping Plover.

Charadrius hiaticula, Var., Wils.
Chradrius melodus, Ord., Bp., Nutt., Aud., Schl., Gray, Finsch.
Charadrius (*Ægialitis*) *melodus*, Ridg.
Ægialitis melodus, Bp., Cab., Bd., Bryant, Scl., and late authors.
Ægialeus melodus, Allen.
Charadrius okeni, Wagl.

Length, about 7.00; wing, 4½; tail, 2.

Hab.—Eastern coast of North America, Cuba, Bahama, Jamaica. (Coues.)

Rare. Colonel Wedderburn shot one at Mangrove Bay in September, 1848, and two were seen on a rocky island in Hamilton Harbor in September, 1850. Mr. Bartram has one specimen. Not observed in 1874.

Family HÆMATOPODIDÆ.

Genus STREPSILAS, Ill.

97. *Strepsilas interpres*, (Linn.) Ill. Turnstone.

Tringa interpres, Linn., Gm., Lath., Wils.
Strepsilas interpres, Ill., Leach, Steph., Bp., Sw. & Rich., Nutt., Eyt., Keys. & Blas., Schl., Aud., and authors generally.

Cinclus interpres, Gray.
Tringa morinella, Linn., Gm.
Strepsilas collaris, Temm., Brehm., Sab., Rich.
Charadrius cinclus, Pall.

Length, 9; wing, 6; tail, 2½.

Hab.—Sea-coast of nearly all countries, less frequent in the interior. (Coues.)

This cosmopolitan species is a frequent visitor. It has been shot as early as the 3d August. I obtained two on the 23d December, 1874, but it probably remains all the winter.

Family RECURVIROSTRIDÆ.

Genus HIMANTOPUS, Briss.

98. *Himantopus nigricollis*, Vieil. Black-necked Stilt.

Charadrius mexicanus, Müller, Cass.
Himantopus mexicanus, Ord., Max., Wagl., Bp.
Charadrius himantopus, Lath.
Recurvirostra himantopus, Wils.
Himantopus nigricollis, Vieil., Bp., Nutt., Aud., and most authors.
Hypsibates nigricollis, Cab.

Length, 14; wing, 8½ to 9; tail, 3.

Hab.—From United States generally, Mexico, part of West Indies, Central America, and South America to Peru and Brazil. (Coues.)

The American representative of our *H. melanopterus*. Only one has occurred, shot at Warwick Pond on the 3d June, 1853, by Mr. Hinson, and sent to Mr. Hurdis.

Family PHALAROPODIDÆ.

Genus LOBIPES, Cuv.

99. *Lobipes hyperboreus*, (Linn.) Cuv. Northern Phalarope.

Tringa hyperborea, Linn., Brünn., Fabr., Gm.
Phalaropus hyperboreus, Lath., Temm., Sab., Bp., Nutt., Aud., Bd., Salv., Coop. & Suck., Lawr., Allen, Schl.
Lobipes hyperboreus, Cuv., Steph., Brehm, Jen., Eyt., Bp., Aud., Gir., Coues, Dall. & Bann., Ridg.
Tringa lobata, Linn.
Tringa fusca, Gm.,
Phalaropus fuscus, Lath.
Phalaropus ruficollis, Pall.
Phalaropus cinerascens, Pall.
Phalaropus cinereus, Mey. & Wolf., Keys. & Blas., Schl., Finsch.

Length, about 7; wing, 4½; tail, 2¼.

Hab.—Northern hemisphere, penetrating to very high latitudes to breed; migratory sometimes into the tropics in winter. (Coues.)

One found dead, floating in Riddle's Bay, March 21, 1848, sent to Rev. H. B. Tristram. A female, partly in ruddy plumage, killed with a stick in Hamilton Harbor on the following day, and a third example captured on the edge of Devonshire Swamp by Mr. Hurdis on the 8th March, 1852. "It is remarkable that all the specimens were obtained without the aid of a gun" (Hurdis).

Family SCOLOPACIDÆ.

Sub-family SCOLOPACINÆ.

Genus PHILOHELA, G. R. Gray.

100. *Philohela minor*, (Gm.) Gray. American Woodcock.

Scolopax minor, Gm., Lath., Wils., Bp., Aud.
Rusticola minor, Vieil., Bp.
Rusticola (Microptera) minor, Nutt.
Philohela minor, Gray, Bd., and of most late authors.
Microptera americana, Aud., Gir.

Length, about 11; wing, 5¼; tail, 2¼.

Hab.—Eastern United States and British Provinces, north to Nova Scotia and Canada, northwest to Fort Rice, Dakota; west to Kansas and Nebraska. (Coues.)

" A single specimen was shot near Hamilton in October, 1842, and one was supposed to have been seen at Hungry Bay a few years afterwards by Mr. Fozard" (Nat. in B., p. 42).

Genus GALLINAGO, Leach.

101. *Gallinago wilsonii*, (Temm.) Bp. American or Wilson's Snipe.

Scolopax gallinago, Wils.
Scolopax wilsonii, Temm., Bp., Sw. & Rich., Nutt., Aud., Gir., Trippe, and of many earlier authors.
Gallinago wilsonii, Bp., Scl., Bd., Salv., and later authors.
Gallinago gallinaria var. *wilsoni*, Ridg.
Gallinago brehmii, Bp.
Scolopax delicatula, Ord.
Scolopax drummondii, Sw. & Rich., Nutt., Aud.
Gallinago drummondii, Bp.
Scolopax douglasii, Sw. & Rich., Nutt.

Length, about 10½; wing, 5; tail, 2¼.

Hab.—The whole of North America, southward to South America; Mexico; West Indies. (Coues) Bermuda.

Usually makes its first appearance at the beginning of October, a straggler or two remaining till January, and occurs also in March, April, and May in limited numbers on its northward journey. It has been seen as early as the 13th September (Hurdis). It seems rather a farce to talk of the snipe-*shooting* in Bermuda; but occasionally large flights come in, and really fair bags are made, such as six or nine couple a-day to two guns. Pembroke Marsh is the great place for them, and a few usually take up their quarters in Devonshire Swamp. They are very good eating at first, but soon become rank from feeding in the brackish mud. They lie closer than our European snipe, and a dog is a *sine quâ non* in the thick scrub-grown marshes. Their note is very similar, but they differ somewhat in plumage, especially in having sixteen tail-feathers instead of fourteen like our bird.

102. *Gallinago media*, Leach. European Snipe; Common Snipe.

Scolopax gallinago, Linn., Gm., Briss.
Gallinago media, Leach.
Gallinago scolopacina, Bp., Naum., Gould.
Gallinago uniclavata, Hodgs.
Gallinago brehmi, Kaup, Jard.
Gallinago delamotti, Bail.
Gallinago sabini, Vig., Gould.

We have Colonel Wedderburn's authority for the occurrence of this bird in Bermuda. He says (Nat. in B., p. 43): "I shot one of this species on the 24th December, 1847. It precisely answered to the description of the *S. gallinago* and had but fourteen tail-feathers. I shot another specimen also with fourteen tail-feathers on the 29th December, 1847. Both these birds I got in Pembroke Marsh, and there cannot be the least doubt about the bird and the propriety of adding it to the Bermuda list."

Genus MACRORHAMPHUS, Leach.

103. *Macrorhamphus griseus*, (Gm.) Leach. Red-breasted Snipe; Grey Snipe.

Scolopax grisea, Gm., Lath., Temm., Flem., Jen., Schl.
Scolopax (*Macrorhamphus*) *grisea*, Bp., Nutt.
Macrorhamphus griseus, Leach, Steph., Eyt., Keys. & Blas., Gray, Bp., Bd., Coop. & Suck., Salv., and late authors.
Limosa grisea, Schl.
Scolopax noveboracensis, Gm., Lath., Wils., Sw. & Rich., Aud., Gir.
Totanus noveboracensis, Sabine.
Macrorhamphus scolopaceus, Lawr., Bd., Elliot, Coues, Dall & Bann.

Length, 10; wing, 5¼; tail, 2¼.

Hab.—The whole of North America, Greenland, Mexico, West Indies, Central America. Much of South America, Brazil, Chili. Of frequent casual occurrence in Europe. (Coues.)

One "shot by Captain Orde on the 29th September, 1847, at Harris's Bay; another was killed by Mr. C. Fozard on the 21st August, 1848"

(Nat. in B., p. 43). A third was obtained on Pearl Island on September 10, 1874, by Captain Kirkwood, Fifty-third Regiment. This specimen was preserved by Captain Rooke, who kindly presented it to me. Three were shot at Peniston's Pond on the 17th September, 1875, by Lieutenant Festing, Twentieth Regiment, and examined by Lieutenant Denison, Royal Engineers.

Genus MICROPALAMA, Bd.

104. *Micropalama himantopus*, (Bp.) Bd. Stilt Sandpiper.

Tringa himantopus, Bp., Less., Sw. & Rich., Aud., Gir., Schl.
Tringa (*Hemipalama*) *himantopus*, Bp., Nutt.
Hemipalama himantopus, Bp., DeKay.
Micropalama himantopus, Bd., Salv., Coues, Lawr., Scl., Dress., Scl. & Salv., Allen, and later authors.
Ereunetes himantopus, Sund.
Micropalama himantopus, Gray.
Hemipalama multistriata, Gray, Pelz.
Tringa (*Hemipalama*) *auduboni*, Nutt.

Length, 8½ to 9; wing, 5¼; tail, 2¼; tarsus, 1¾.

Hab.—North America generally; not observed west of Rocky Mountains; rare in the United States. West Indies; Central America; most of South America. (Coues.)

Colonel Wedderburn killed two, one of which he unfortunately lost, in the beginning of August, 1848. Lieutenant Denison, Royal Engineers, records another, shot by Lieutenant Festing, Twentieth Regiment, at Peniston's Pond, early in September, 1875.

Genus EREUNETES, Illiger.

105. *Ereunetes pusillus*, (Linn.) Cass. Semipalmated Sandpiper.

Tringa pusilla, Linn., Gm., Lath., Schl.
Ereunetes pusillus, Cass., Coues, and most late U. S. authors.
Ereunetes petrificatus, Ill., Cass., Hayd., Trippe, Snow.
Tringa semipalmata, Wils., Vieil., Sw. & Rich., Aud., Gir., Newb.
Tringa (*Hemipalama*) *semipalmata*, Bp.
Tringa (*Heteropoda*) *semipalmata*, Nutt.
Heteropoda semipalmata, Bp., DeKay, Gray.
Ereunetes semipalmata, Cab., Bp.
Pelidna brissoni, Less.
Heteropoda mauri, Bp., Gundl.
Hemipalama minor, Lemb.
Ereunetes occidentalis, Lawr.

Length, 6½; wing, 3¾; tail, 1¾.

Hab.—The whole of North, Central, and most of South America. (Coues).

A regular visitor, arriving about the 1st August, or a few days earlier, and found in small flocks in the sandy bays, and on the margins of the open brackish ponds throughout the islands. They do not remain long.

Genus TRINGA, Linn.

106. *Tringa minutilla*, Vieil. Least Sandpiper; American Stint.

Tringa minutilla, Vieil., Gray, Sh. & Dress., Coues, Finsch.
Actodromus minutilla, Bp.
Actodromas minutilla, Coues, Dress., Lawr., Allen, Verr., Newton, Dall & Bann., Mayn., Ridg.
Tringa pusilla, Wils., Ord., Brewer, Bp., Sw. & Rich., Aud., Gir.
Pelidna pusilla, Bp., Gosse.
Tringa wilsoni, Nutt., Bd., Coop. & Suck., Cass., Trippe.
Actodromus wilsoni, Bp.
Tringa nana, Licht.

Length, 5½ to 6; wing, 3½ to 3¾; tail, 1¾.

Hab.—North, Central, and South America and West Indies; accidental in Europe. (Coues.)

Arrives about the same time, and frequents the same localities, as the preceding species. I shot one as late as the 23d December, probably a straggler left behind. I also obtained a solitary example on its northward flight on the 29th April, 1875, at Peniston's Pond.

107. *Tringa maculata*, Vieil. Pectoral Sandpiper. "Jack Snipe."

Tringa maculata, Vieil., Wheat., Schl., Blas., Dress., Sund., Hart., Coues, Scl. & Salv.
Tringa (Actodromas) maculata, Cass., Ridg.
Actodromas maculata, Coues, Allen, Verr., Lawr., Coop., Mayn.
Pelidna pectoralis, Bp., Cass.
Tringa pectoralis, Say, Bp., Nutt., Gm., Eyt., Keys. & Blas., Aud., Temm., Gir., DeKay, Schl., Gray, Meyer, Reinh., Sund.
Tringa dominicensis, Degl.

Length, 9; wing, 5¼; tail, 2½.

Hab.—North, Central, and South America, West Indies, Greenland, Europe. (Coues.)

Not uncommon in September and October. The first I met with was feeding with a small flock of Semipalmated Sandpipers at Peniston's Pond, on August 3, 1874. It was tolerably abundant till towards the end of October, being usually found singly. Colonel Wedderburn says of this species (Nat. in B., p. 44): "On the 9th October, 1849, they appeared suddenly in thousands, particularly at St. George's, after a heavy gale of wind; the parade ground at that place was swarming with them, and I think Colonel Drummond killed some thirty or forty couple before breakfast; but, with the exception of a few stragglers, they were all gone by the following day."

108. *Tringa fuscicollis*, Vieil. Bonaparte's or White-rumped Sandpiper.

Tringa fuscicollis, Vieil., Dress.
Tringa cinclus, var., Say.
Tringa schinzii, Bp., Nutt., Sw. & Rich., Aud., Eyt., Gray, Gir., DeKay.

Pelidna schinzii, Bp.
Tringa bonapartii, Schl., Gray, Coues, Scl. & Salv.
Actodromas (*Heteropygia*) *bonapartii*, Coues.
Actodromas bonapartii, Coues, Allen, Lawr., Verr., Mayn.
Tringa melanotus, Blas.
Actodromus melanotos, Bp.
Pelidna melanotos, Degl.-Gerbe., Bp.
Tringa dorsalis, Licht.

Length, 7½; wing, 4.7; tail, 1.8.

Hab.—North America, east of Rocky Mountains; not observed in Alaska (where, however, its occurrence may be anticipated). Breeds in the far north. Migratory through United States in the Eastern Province. Winters in the Southern States, Greenland, West Indies, Central and South America. Accidental in Europe. (Coues.)

This bird did not occur in the autumn of 1874, to my knowledge. It is recorded by Colonel Wedderburn, and is, I believe, sufficiently numerous at times, especially in the Great Sound and Castle Harbor.

109. *Tringa maritima*, Brünn. Purple Sandpiper.

Tringa maritima, Brünn., Gm., Lath., Vieil., Temm., Less., Sab., Rich., Sw. & Rich., Bp., Nutt., Naum., Aud., Keys. & Blas., Schinz, Schl., Gir., and many later authors.
Tringa (*Arguatella*) *maritima*, Bd., Gray, Ridg.
Arquatella maritima, Coues, Verr., Allen, Lawr., Mayn.
Pelidna maritima, Bp.
Totanus maritimus, Steph.
(?) *Tringa striata*, Linn., Gm., Fab., Lath., Flem.
Tringa undata, Brünn., Gm., Lath., Vieil.
Tringa nigricans, Mont., Leach, Brehm.
Trynga arquatella, Pall.
Tringa canadensis, Lath., Vieil.
Tringa littoralis, Brehm.

Length, 8 to 9; wing, 5; tail, 2½.

Hab.—North America, northerly and chiefly coastwise, south to the Middle States in winter, Great Lakes. Greenland, Europe, Asia. (Coues.)

One was seen by Colonel Wedderburn at the entrance to St. George's Harbor.

Genus CALIDRIS, Cuv.

110. *Calidris arenaria*, (Linn.) Ill. Sanderling.

Tringa arenaria, Linn., Schl., Aud.
Calidris arenaria, Ill., Leach, Temm., Licht., Bp., Flem., Brehm., Sw. & Rich., Nutt., Naum., and authors generally.
Charadrius calidris, Linn., Wils.
Charadrius rubidus, Gm., Wils.

Arenaria vulgaris, Bechst., Temm., Steph.
Trynga tridactyla, Pall.
Calidris tringoides, Vieil.
Calidris americana, Brehm.

Length, 7¾ to 8; wing, 5; tail, 2.

Hab.—Sea-coasts of nearly all countries. (Coues.)

Generally to be found in the autumn months, especially on the sandy beach below the sand-hills, where I obtained specimens in November, 1874. One of these I lost temporarily, and on recovering it the next day I found that not only the body, but the webs and *shafts* of the feathers had been devoured by a swarm of voracious ants.

Sub-family TOTANINÆ.

Genus LIMOSA, Briss.

111. *Limosa hudsonica*, (Lath.) Sw. Hudsonian Godwit.

Scolopax alba et candida, Linn.
Scolopax lapponica, var. β, Gm.
Scolopax hudsonica, Lath.
Limosa hudsonica, Sw. & Rich., Nutt., Aud., Bp., Gir., Bd., Scl., Cab., Scl. & Salv., and later authors.
Limosa melanura, Bp., not of authors.
Limosa ægocephala, Bp., not of authors.
Limosa australis, Gray.

Length, 15; wing, 8; tail, 3.

Hab.—Northern and Eastern North America; West Indies; South America; not noted west of Rocky Mountains; rare along Atlantic. (Coues.)

A specimen of this bird in Mr. Bartram's collection was shot near the Causeway at St. George's in the autumn of 1875.

Genus SYMPHEMIA, Rafin.

112. *Symphemia semipalmata*, (Gm.) Hartl. Willet.

Scolopax semipalmata, Gm., Lath., Wils.
Totanus semipalmatus, Temm., Bp., Sw. & Rich., Aud., Gir., Coues.
Totanus (*Catoptrophorus*) *semipalmatus*, Bp., Nutt.
Catoptrophorus semipalmatus, Bp., Blas.
Glottis semipalmata, Nilss.
Hodites semipalmata, Kaup.
Symphemia semipalmata, Hartl., Bd., Cab., Scl., Cass., Coop. & Suck., and late authors.
Totanus crassirostris, Vieil.
Symphemia atlantica, Rafinesque.

Length, about 15; wing, 8¼; tail, 3¼.

Hab.—Temperate North America, north to 56°, but chiefly United

States; resident in the Southern States, West Indies, Central and South America. Accidental in Europe. (Coues.)

One was shot by Colonel Wedderburn on Pearl Island on July 3, 1848; doubtless a young bird driven by stress of weather from the breeding haunts of the species on the North American shores.

Genus GAMBETTA, Kaup.

113. *Gambetta melanoleuca*, (Gm.) Bp. Greater Yellow-shanks; Tattler.

Scolopax melanoleuca, Gm., Lath.
Totanus melanoleucus, Vieil., Licht., Bp., Aud., Coues, Finsch.
Gambetta melanoleuca, Bp.. Bd., Coop. & Suck., Coues & Prent., Hayd., Verr., Allen, Dress., Lawr., Dall & Bann., Mayn.
Scolopax vociferus, Wils.
Totanus vociferus, Sab., Sw. & Rich., Nutt., Aud., Gir., Putn., Trippe.
Totanus sasashew, Vieil.
Totanus chilensis, Philippi.

Length, about 14; wing, 7½ to 8; tail, 3¼ to 3½.

Hab.—The Western Hemisphere; breeds mostly in high latitudes; abundant. (Coues.)

More or less common, arriving early in August, remaining for a month or so. Much in request among the energetic sportsmen who brave the heat and mosquitoes for the sake of a "bag" of "snippets." Its quadruple note, "thew-thew-thew-thew," is very loud and striking. Mr. Hurdis mentions one killed, when on its northward migration, on the 5th June, 1852. Another was shot by Lieutenant Denison on the 27th April, 1875, and one seen at the same time, but not obtained.

114. *Gambetta flavipes*, (Gm.) Bp. Yellow-shanks; Lesser Tell-tale.

Scolopax flavipes, Gm., Lath., Wils.
Totanus flavipes, Vieil., Bp., Sab., Sw. & Rich., Nutt., Aud., Gir., Moschl., Putn., Reinh., Yarr., Newton, Trippe, Coues, Ridg.
Gambetta flavipes, Bp., Bd., Coues & Prent., Verr., Allen, Coues, Dress., Lawr., Dall & Bann., Mayn., Trippe, Snow.
Totanus fuscocapillus et *natator*, Vieil.

Length, 10 to 10½; wing, 6 to 6½; tail, 2½.

Hab.—Western Hemisphere; many winter in Southern States; accidental in Europe. (Coues.)

The most conspicuous and noisy of the August arrivals. It has been seen as early as the 13th July, but usually disappears towards the end of September. Considerable numbers fall victims to the gun, as they are not bad eating. If a wounded one falls into the water it is possible to shoot the whole of the flock, as they hover over their unfortunate companion. This murderous proceeding is alluded to, I think, by Wilson. The only instances of the occurrence of this species in the spring took place in 1875, when I saw one on the 26th, and obtained two at Peniston's Pond on the 29th April. These were, of course, in beautiful plumage.

Genus RHYACOPHILUS, Kaup.

115. *Rhyacophilus solitarius* (Wils.), Cass. Solitary Sandpiper.

Tringa ochropus, var *β*, Lath.
Tringa solitaria, Wils.
Totanus solitarius, Aud., Gir., Hoy, Schl., Gray, Hart., Coues.
Rhyacophilus solitarius, Cass., Coues & Prent., Hayd., Verr., Allen, Coues, Dress., Lawr., Dall & Bann., Mayn., Stev.
Totanus chloropus, var. *solitarius*, Ridg.
Totanus choloropygius, Vieil., Bp., Sw. & Rich., Wagl., Nutt., Aud.
Rhyacophilus chlorophygius, Bp.
Totanus glareola, Ord.
Totanus macroptera, Spix.

Length, 8 to 8½; wing, 5; tail 2¼.

Hab.—Western Hemisphere; accidental in Europe; North to Alaska; winters in Mexico, Central and South America, and West Indies. (Coues.)

I observed one on the 19th July, 1874, but they generally come with the other species in August. They soon betake themselves to the wooded swamps, where they may be found singly or in pairs throughout the autumn. Fresh arrivals sometimes take place in the spring. Their habit of bobbing the head and body when alarmed is very comical.

Genus TRINGOIDES, Bp.

116. *Tringoides macularius*, (Linn.) Gray. Spotted Sandpiper.

Tringa mucularia, Linn., Gm., Lath., Wils.
Totanus macularius, Temm., Boie, Flem., Eyt., Brehm, Bp., Nutt., Aud., Gir., Hoy, Trippe.
Actitis macularius, Boie, Naum., Bp., Keys & Blas., Schl., Finsch.
Tringoides macularius, Gray, Bd., Coop. & Suck., Coues, Hayd., Dress., Dall & Bann., Mayn., Allen, Stev., and most late U. S. authors.
Tringites macularius, Scl. & Salv.
Trigna notata, Ill.

Length, 7½ to 8; wing, 4½; tail, 2.

Hab.—North America at large; winters in Southern States and beyond; Central and South America to Brazil; West Indies; casual in Europe. (Coues.)

Flocks of young birds appear early in August, followed soon after by a limited number of adults. They frequent the same places as the other "snippets," and serve to swell the "bag" of the gunner in August and September. A few remain all the winter, and several examples have been observed in spring, presumably strangers on their way north. The "weet-weet" of this bird, as it skims over the water like the European Common Sandpiper, is very familiar to residents in the islands.

Genus ACTITURUS, Bp.

117. *Actiturus bartramius*, (Wils.) Bp. Bartram's Sandpiper.

Tringa bartramia, Wils., Aud., Gir., Putn., Trippe.
Tringa (*Euliga*) *bartramia*, Nutt.
Totanus bartramius, Temm., Bp., Sw. & Rich., Aud., Hoy.
Actiturus bartramius, Bp., Bd., Coues & Prent., Hayd., Verr., Allen, Coues, Lawr., Scl., Dress., Cab., and late authors.
Tringoides bartramius, Gray, Pelz.
Actitis bartramius, Schl.
Tringa longicauda, Bechs., Naum.
Actiturus longicaudus, Blas.
Bartramius longicaudus, Bp.
Totanus variegatus, Vieil.
Bartramia laticauda, Less.

Length, about 12; wing, 6½; tail, 3½.

Hab.—North America, north to the Yukon; not observed in United States west of the Rocky Mountains; Atlantic coast of Nova Scotia; winters in Mexico, West Indies, Central and South America to Brasil; casual in Europe; Australia. (Coues.)

No early records. One in my collection was shot by Gibbs at Peniston's Pond on September 20, 1874. It was a single bird, and was in company with a flock of small Sandpipers at the time. Lieutenant Denison, Royal Engineers, shot a second specimen in a field near Peniston's Pond on the 18th September, 1875.

Genus NUMENIUS, Linn.

118. *Numenius hudsonicus*, Lath. Hudsonian Curlew.

Scolopax borealis, Gm., Wils.
Numenius borealis, Ord., Brewer.
Numenius hudsonicus, Lath., Bp., Sw. & Rich., Nutt., Aud., Gir., Bd., Reinh., Dress., and late authors generally.
Numenius intermedius, Nutt.
Numenius rufiventris, Vig.
Numenius phæopus, Cab., Pelz.
Numenius brasiliensis, Maxim.

Length, about 18; wing, 9; tail, 4; bill, 3 to 4.

Hab.—North America; Greenland; Central and South America; no West Indian record; migratory through United States; winters in Southern States and far beyond. (Coues.)

Appears early in August, in limited numbers, and is so wary that very few are ever obtained. Mr. Hurdis says: "In August and September the loud whistle of this Curlew is sometimes heard on the shores of Bermuda. It is generally seen alone, and from its wary habits is difficult to approach. Of the four specimens which I examined, one was shot on the 14th August, and the remainder in September. During the dark nights of this season of the year flocks of this Curlew occasionally pass at a low elevation toward the south, disturbing the profound tranquillity which reigns by their oft-repeated, clear, whistling note."

119. *Numenius borealis*, (Forst.) Lath. Esquimaux Curlew.

Scolopax borealis, Forst.
Numenius borealis, Lath., Bp., Sw. & Rich., Nutt., Aud., Gir., Bd., Coues, Verr., Allen, Salv., and modern authors generally.
Numenius brevirostris, Licht., Darw., Pelz.
Numenius microrhynchus, Phil. & Landb.

Length, about 13½; wing, 8¼; tail, 3; bill, 2¼ to 2½.

Hab.—North and Middle America; not recorded west of Rocky Mountains; Alaska; winters in Middle and South America; no West Indian record; accidental in Europe; breeds within the Arctic circle. (Coues.)

Commoner and easier to approach than the preceding. Locally termed "Wood Snipe." A good number accompanied the Golden Plover on their arrival in September, 1874, and several were killed along the north shore. Both species of Curlew remain but a short time. The Esquimaux is easily distinguishable from the Hudsonian Curlew by its smaller size and comparatively short and weak bill.

Sub-order HERODIONES.

Family TANTALIDÆ.

Sub-family IBIDINÆ.

Genus Ibis, Möhring.

120. *Ibis falcinellus*, Bp. Glossy Ibis.

Tantalus mexicanus, Gm., Lath., Ord.
Ibis falcinellus, Bp., Nutt., Aud., Allen, Ridg.
Ibis falcinellus var. *ordii*, Coues.
Ibis ordii, Bp., Bd., Allen, Lawr., Coues, Mayn.
Falcinellus ordii, Bp., Coues.

Length, 25; wing, 12; tail, 4¾.

Hab.—United States, southerly, straying north to Massachusetts and Ohio. (Coues.)

An inhabitant of the Southern United States, separated from the European species by Bonaparte in 1838, but now considered indentical with it. One example only has occurred in Bermuda, seen by Mr. Hurdis, but not obtained.

Family ARDEIDÆ.

Sub-family ARDEINÆ.

Genus ARDEA, Linn.

121. *Ardea herodias*, Linn. Great Blue Heron.

Ardea herodias, Linn., Gm., Lath., Wils., Temm., Bp., Sw. & Rich., Nutt., Aud., Gir., Bd., Scl., Newton, and authors generally.
Ardea hudsonias, Linn., Gm., Lath.

Length, 42; wing, 18¼.

Hab.—North America to Hudson's Bay and Sitka; south to Guatemala and Galapagos; West Indies; breeds throughout its range; winters in the south. (Coues.)

Of this fine species Colonel Wedderburn says (Nat. in B., p. 38): "Many of these birds arrive in autumn, and a few remain throughout the year. In 1846 the nest of this bird, containing two eggs, was found amongst the mangrove trees at Hungry Bay. The Rev. H. B. Tristram kept one of these Herons alive in his garden (at the parsonage in Ireland Island), which was once seen to seize a Ground Dove and swallow it entire." I made numerous inquiries, and kept a careful lookout, but was unable to ascertain whether any second instance occurred of the nest being found. Most of the examples obtained or seen during my stay were in immature plumage. A few were always to be seen singly among the islands in the Great Sound and Castle Harbor, being very wary and hard to approach.

122. *Ardea egretta*, (Gm.) Gray. Great White Egret.

Ardea egretta, Gm., Lath., Wils., Nutt., Aud., Coues.
Herodias egretta, Gray, Bd., Coues & Prent., Allen, Coues, Dress., Lawr., Mayn.
Herodias alba var. *egretta*, Ridg.
Herodias egretta var. *californica*, Bd.
Ardea leuce, Ill., Licht.
Egretta leuce, Bp.
Herodias leuce, Brehm.
Ardea alba, Bp.

Length, 39; wing, 15½.

Hab.—United States southerly, straggling northward to Nova Scotia, Massachusetts, Canada West, and Minnesota; West Indies, Mexico, Central and South America. (Coues.)

Two were killed at Hungry Bay in 1840; several were subsequently seen, but not obtained. A colored youth described two of these birds to me as having been seen by him in Warwick Swamp in October, 1874, adding that he shot one, but it was too much knocked about to keep. These may have belonged to the next species; but, from the size mentioned, I fancy them to be referable here. Mr. Bartram has obtained one specimen. Lieutenant Denison, Royal Engineers, informs me that one was shot in Devonshire Swamp by Captain Hussey, Twentieth Regiment, on the 6th October, 1875, and presented to him.

123. *Ardea candidissima*, Gm. Snowy Heron.

Ardea nivea, Jacq., Lath., Licht.
Egretta nivea, Cab.
Ardea candidissima, Gm., Wils., Bp., Nutt., Aud., Gir., Coues.
Egretta candidissima, Bp., Gosse.
Herodias candidissima, Gray, Gundl.
Garzetta candidissima, Bp., Bd., Cass., Allen, Coues, Scl. & Salv., Dress., Lawr., Mayn., Ridg.
Ardea carolinensis, Ord.

Length, 24; wing, 10.20.

Hab.—United States southerly. North, regularly to Middle States; casually, to Massachusetts and even Nova Scotia. Kansas; Mexico; West Indies; Central and South America to Chili. Resident in Gulf States and farther south.

Two beautiful specimens, in full plumage, were shot by Colonel Wedderburn in April, 1850, and several were seen in September following. Thus it seems that it visits the islands both in spring and autumn at the usual periods of migration. Mr. Bartram has a pair in his collection.

124. *Ardea cærulea*, Linn. Little Blue Heron.

Ardea cærulea, Linn., Gm., Lath., Wils., Ord., Bp., Aud.
Ardea (*Botaurus*) *cærulea*, Bp., Nutt.
Egretta cærulea, Bp., Gosse.
Florida cærulea, Bd.
Herodias cærulea, Gray, Gundl.
Ardea cærulescens, Lath., Licht., Wagl.

Length, 22; wing, 11.

Hab.—South Atlantic and Gulf Coast to Mexico. (Baird.)

Mr. Hurdis says: "Of seven specimens of this heron which came under my observation, four were shot in April and May, and three in September and October; it may therefore be considered both a vernal and autumnal visitor to the Bermudas. Three of the spring specimens were beautiful exemplifications of the change from the white plumage of the young to the rich vinous purple of the adult bird." Several of these examples are alluded to by Colonel Wedderburn in his notes. I do not think the bird visits the islands regularly. I obtained a beautiful male from Hungry Bay on the 4th of May, 1875. It was in company with a white bird, perhaps an immature specimen of the same species.

125. *Ardea virescens*, Linn. Green Heron.

Ardea virescens, Linn., Gm., Lath., Wils., Bp., Wagl., Nutt., Aud., Gir., Sund., Coues.
Ardea (*Botaurus*) *virescens*, Bp.
Herodias virescens, Boie, Bp., Gosse.
Egretta virescens, Sw.
Butorides virescens, Bp., Scl., Scl. & Salv., Bd., Newton, and most recent authors.
Ardea ludoviciana, Gm., Lath.
Ardea chloroptera et *maculata*, Bodd.

Length, 15; wing, 7½.

Hab.—United States generally, breeding throughout and wintering in the south; Canada West; Mexico; West Indies; Central America to Venezuela. (Coues.)

Occurs on both migrations, sometimes in considerable numbers in the spring, frequenting the dense mangroves, and being uncommonly hard to obtain. Lieutenant Denison and I each shot two beautiful specimens in April, 1875.

Genus NYCTIARDEA, Sw.

126. *Nyctiardea grisea* var. *nævia*, (Bodd.) Allen. American Night Heron.

Botaurus nævius, Briss.
Ardea nævia, Bodd.
Nyctiardea nævea, Gray.
Nycticorax nævia, Gray, Scl. & Salv.
Nyctiardea grisea var. *nævia*, Allen, Coues.
Nycticorax griseus, Reinh, Allen.
Ardea hoactli, Gm., Lath.
Ardea gardeni, Gm., Lath.
Nycticorax gardeni, Jard., Sp., Gundl., Scl., Scl. & Salv.
Nyctiardea gardeni, Bd., Coop. & Suck., and many late U. S. authors.
Nyctiardea grisea var. *gardeni*, Ridg.
Ardea nycticorax, Wils., Bp., Aud.
Ardea discors, Nutt.
Nycticorax americanus, Bp., Tsch., Gosse.

Length, about 25; wing, 12.50; tarsus, 3.15; bill, 3.10.

Hab.—United States and British Provinces; breeds abundantly in New England; winters in the South and beyond. Part of West Indies, Mexico, Central America, South America.

Immature birds are not uncommon in the larger mangrove swamps in the autumn and winter, but none have yet been obtained in adult plumage. One examined by Mr. Hurdis, shot on the 9th February, had the irides bright carmine, and the long filamentous plumes of the occiput beginning to appear. These birds sit motionless among the mangroves, and when disturbed fly into the tops of the thickest trees, whence they are very hard to dislodge. I obtained a few specimens during my stay.

127. *Nyctiardea violacea*, (Linn.) Sw. Yellow-crowned Night Heron.

Ardea violacea, Linn., Gm., Lath., Wils., Bp., Aud.
Ardea (*Botaurus*) *violacea*, Bp., Nutt.
Nyctiardea violacea, Sw.
Nycticorax violaceus, Bp.
Nyctherodius violaceus, Reich., Bp., Gundl.
Ardea jamaicensis, Gm.
Ardea cayanensis, Gm.
Ardea sexsetacea, Vieil.
Ardea callocephala, Wagl.

Length, 24; wing, 12; tarsus, 3.70; bill, 2.78.

Hab.—South Atlantic and Gulf States. South America. (Baird.)

Unlike its congener, this Heron has occurred in the plumage of the adult. Mr. Bartram has obtained several fine specimens. I obtained two myself, but both were in the spotted garb of youth. There is a great similarity between the young of these two species, but *violacea* may always be distinguished in any plumage, by its longer tarsus and shorter bill. Occurs pretty regularly in small numbers, usually in autumn, but occasionally in spring. One of my specimens was shot as early as the 3d August.

Genus BOTAURUS, Steph.

128. *Botaurus lentiginosus*, (Mont.) Steph. American Bittern.

Botaurus freti-hudsonis, Briss., Degl.
Ardea freti-hudsonis, Schl.
Ardea hudsonias, Merr.
Ardea stellaris var., Forst.
Ardea stellaris var. *β*.
Botaurus freti-hudsonis, Lath.
Ardea stellaris var. *β. minor*, Gm.
Ardea minor, Wils., Bp., Aud.
Botaurus minor, Boie., Bp., Gundl., Gray, Coues.
Ardea lentiginosa, Mont., Jen., Leach., Temm., Flem., Eyt., Keys. & Blas., Sab., Sw. & Rich., Nutt., Aud., Gir., Trippe.
Botaurus lentiginosus, Steph., Gray, Bd., Coop. & Suck., Coues, Hayd., Cass., Mayn., Dress., Salv., and many recent authors.
Butor lentiginosus, Jard.
Butor americana, Sw.
Ardea mokoko, Vieil., Wagl.
Ardea adspersa, Licht.

Length, 26.50; wing, 11.00; tarsus, 3.60; bill, 2.75.

Hab.—Entire temperate North America up to 58° or 60°; Cuba; south to Guatemala; regularly migratory; accidental in Europe. (Coues.)

A regular visitor in the autumn, and occasionally in March, frequenting the sedgy patches on the edges of the mangrove swamps. Mr. Hurdis says: "The stomach of one, shot in the Pembroke Marshes, contained an eel 6 inches long, a mouse, a dragonfly, a grasshopper, and part of a small golden carp." To show how plentifully they arrive in certain years, I may mention (though a cold shudder passes through me as I do so) that no less than *thirteen* were shot by one officer, who shall be nameless, in the autumn of 1875.

Genus ARDETTA, Gray.

129. *Ardetta exilis*, (Gm.) Gray. Least Bittern.

Ardea exilis, Gm., Lath., Wils., Wagl., Nutt., Aud., Gir., Newb.
Ardea (*Ardeola*) *exilis*, Bp.
Ardeola exilis, Bp., Gosse, Hoy.
Butor exilis, Sw.
Ardetta exilis, Gray, Gundl., Bd., Scl., Coues & Prent., Verr., Allen, Coues, Lawr., Dress., Mayn., Salv., Ridg., &c.

Length, 13.00; wing, 4.75; tarsus, 1.60; bill, 1.75.

Hab.—United States and British Provinces; breeds throughout its United States range, wintering in the South, Cuba, Jamaica, Central (and South?) America. (Coues.)

Has occurred both in spring and autumn, but, from its frequenting the thick mangrove swamps and hiding among their tangled roots, has not very often been obtained. Colonel Wedderburn procured several specimens between 1847 and 1850. I shot a female near the Sluicegates on March 1, 1875, and Lieutenant Denison records one shot at Basden's Pond in December, 1875.

Sub-order ALECTORIDES.

Family RALLIDÆ.

Sub-family RALLINÆ.

Genus RALLUS, Linn.

130. *Rallus virginianus*, Linn. Virginian Rail.

Rallus virginianus, Linn., Gm., Wils., Bp., Nutt., Aud., Gir., Gundl., Bd., Coop. & Suck., Scl. & Salv., Dress., and modern authors.
Aramus (*Pardirallus*) *virginianus*, Gray.
Rallus aquaticus var. β, Lath.
Rallus limicola, Vieil.

Length, about 7½; wing, 4; tail, 1½.

Hab.—Entire United States and British Provinces; breeds commonly in New England; winters in Southern States and beyond. South to Guatemala; Cuba. (Coues.)

One was shot by Mr. Hurdis on the 6th November, 1851. He remarks: "This is the only genuine *Rail* met with—a singular circumstance, when we bear in mind that *all* the Gallinules and Crake-Gallinules known to the continent of North America have been obtained in the Bermudas." No other instance of this bird's occurrence is on record.

Genus PORZANA, Vieil.

131. ***Porzana carolina***, (Linn.) Cab. Sora Rail; Carolina Rail.

Rallus carolinus, Linn., Gm., Bp., Sw. & Rich., Aud.
Rallus (Crex) carolinus, Bp., Nutt.
Gallinula carolina, Lath., Sab.
Ortygometra carolina, Bp., Aud., Gosse, Gir., Reinh.
Porzana carolina, Bd., Gundl., Scl., Newton, Dress., Hayd., Scl. & Salv., Lawr., Sund., and of all late U. S. writers.
Aramides (Mustelirallus) carolina, Gray.
Crex carolina, Hart.
Rallus stolidus, Vieil.

Length, about 8½; wing, 4¼; tail, 2.

Hab.—Entire temperate N. A., winters in Southern States and beyond. South to Venezuela. Various West Indian Islands. Greenland. Accidental in Europe. (Coues.)

Visits Bermuda regularly, arriving early in September (one has been shot on the 24th August) and remaining till November, a few lingering on through the winter. On their vernal migration they frequently appear in considerable numbers in March and April. I have seen them as late as the 1st May. An extraordinary large flight visited the islands in October, 1849, departing in a body after a three-weeks' stay. These birds are a great nuisance to the gunner in search of snipe and other denizens of the marshes, as they bother a dog sadly both by their numbers and their skulking habits; and they themselves are not worth powder and shot, except immediately after their arrival.

132. ***Porzana noveboracensis***, (Gm.) Cass. Little Yellow Rail.

Fulica noveboracensis, Gm.
Gallinula noveboracensis, Lath.
Ortygometra noveboracensis, Steph., Bp., Aud., Gir., Putn.
Rallus noveboracensis, Bp., Nutt., Sw. & Rich., Aud.
Coturnicops noveboracensis, Bp.
Porzana noveboracensis, Cass., Coues & Prent., Allen, Coues, Dress., Scl. & Salv., Lawr., Mayn., Ridg.
Aramides (Coturnicops) noveboracensis, Gray.
Perdix hudsonica, Lath.
Rallus ruficollis, Vieil.

Length, about 6; wing, 3¾; tail, 1¾.

Hab.—Eastern North America, north to Hudson's Bay, but in New England not observed beyond Massachusetts. Apparently nowhere abundant. Winters in Southern States.

Two obtained in Pembroke Marsh by Colonel Wedderburn in October, 1847, but not since recorded.

133. *Porzana jamaicensis*, (Gm.) Cass. **Little Black Rail.**

Rallus jamaicensis, Gm., Lath., Aud.
Ortygometra jamaicensis, Steph., Bp., Aud., Gosse, Salv.
Crecíscus jamaicensis, Cab., Gundl.
Porzana jamaicensis, Cass., Coues & Prent., Scl., Scl. & Salv., Schl., Coues, Ridg.
Aramides (*Creciscus*) *jamaicensis*, Gray.
Crex pygmaea, Blackwell.
Ortygometra chilensis, Bp.

Length, about 5; wing, 3¼; tail, 1¼.

Hab.—South America to Chili. Central America. West India. North America to New Jersey and Kansas, rare.

Observed, and also obtained, by Colonel Wedderburn in 1847 and 1848, and by Mr. Hurdis in 1851, always in the autumn.

Genus Crex, Bechst.

134. *Crex pratensis*, Bechst. **Land-Rail; Corn-Crake.**

Rallus crex, Linn., Degl.
Gallinula crex, Lath.
Crex pratensis, Bechst., Cass., and authors generally.

Length, about 10; wing, 5½; tail, 2.15.

Hab.—Europe; Greenland; Accidental on Atlantic coast of United States. (Baird.)

Colonel Wedderburn shot the only specimen of this European bird ever obtained in Bermuda, on the 25th October, 1847, and sent a notice of its occurrence to "The Zoologist" in 1849. At that time it was probably not known that the species is a straggler to the United States, but latterly several instances of its appearance there have been recorded, so that the fact of its being killed in Bermuda has lost much of the mystery which was originally connected with it.

Sub family FULICINÆ.

Genus GALLINULA, Briss.

135. *Gallinula galeata*, (Licht.) Bp. **Florida Gallinule.**

Crex galeata, Licht.
Gallinula galeata, Bp., Nutt., Max., [illegible], Coues, Gundl., Bd., Newton, and others.
[illegible], Bp., [illegible]
[illegible] *galeata*, [illegible] & Finsch, Ridg.

Length, about 12½; wing, 6¾; tail, 3.

Hab.—Southern countries of North America; Louisiana, Florida, Texas; South America. Accidental in Middle and Northern States. (Baird.)

Resident, tolerably abundant, breeding in the flags and sedges in the deepest and most inaccessible parts of the marshes. Also migratory, visitors appearing in October. Like the "Sora," this is a sad pest to the snipe-shooter when working the thick places, unless his dog be as steady as old Time.

With regard to the specific distinction between this bird and *G. chloropus* of Europe, it would appear that there is so little difference that "doctors disagree" on the question. I never compared specimens myself, but Mr. Hurdis says, in his MS. notes: "On a careful comparison of British specimens with those shot in the Bermudas the resemblance of the two was so strongly marked that, in my humble opinion, they are identical."

Genus PORPHYRULA, Blyth.

136. ***Porphyrula martinica***, **(Linn.) Blyth. Purple Gallinule.**

Fulica martinica, Linn.
Gallinula martinica, Lath., Bp., Nutt., Aud.
Crex martinica, Licht.
Porphyrio martinica, Gosse, Cab.
Fulica martiniocensis, Jacq., Gm.
Ionornis martinicensis, Reich.
Fulica flavirostris, Gm.
Porphyrio tavona, Vieil.
Porphyrio cyanicollis, Vieil.
Gallinula porphyrio, Wils.
Porphyrio americanus, Sw.
Martinico gallinule, Lath.

Length, 12½; wing, 7; tail, 3.

Hab.—Southern States of North America, Louisiana, Florida. Accidental in Middle and Northern United States. (Baird).

Several were obtained in 1849 and 1850, in the month of April, and one on the 30th May, 1851. Mr. Hurdis's notes contain the following: "On the 22d October, 1851, I shot one of these Gallinules in the olive-green plumage of the young, and as these birds never remain to breed in the Bermudas, this specimen must have found its way over sea. I know of no other instance of the young being met with. In April, 1852, this Gallinule was again observed, and in June, 1853, I examined a specimen preserved by W. Clutterbuck, esq., Fifty-sixth Regiment; date of its occurrence unknown. Its appearance, with one exception, has been vernal."

Mr. Bartram has several specimens. I am almost sure I saw one in Devonshire Swamp in February, 1875. The shy habits and nature of the haunts of this species doubtless prevent many examples being recorded in the visiting list.

Genus FULICA, Linn.

137. *Fulica americana*, Gm. American Coot.

Fulica americana, Gm., Lath., Bp., Sw. & Rich., Sab., Nutt., Aud., Bd., Coues, and of all late American writers—Scl., Scl. & Salv., Sund., Reinh., Gosse.
Fulica wilsoni, Steph.
Fulica atra, Wils.

Length, about 14; wing, 7; tail, 2.

Hab.—Entire temperate North America, Alaska, Greenland, Mexico, West Indies, Central America. (Coues.)

A regular visitor in autumn, but never in great numbers. It also occurs on its northward journey, for Mr. Hurdis records one killed at Somerset on the 28th May, 1847, and I watched one close to me at Basden's Pond on the 27th April, 1875.

Order LAMELLIROSTRES.

Family PHŒNICOPTERIDÆ.

Genus PHŒNICOPTERUS, Linn.

138. *Phœnicopterus ruber*, Linn. American Flamingo.

Phœnicopterus ruber, Linn., Gm., Wils., Bp., Nutt., Aud.

Length, 45 inches; wing, 16.50; tarsus, 12; bill, 5.90.

Hab.—Warmer parts of America. Rare on the Florida Keys. (Baird.)

Though never actually obtained in the Bermudas, I think the following interesting account from Mr. Hurdis's MS. notes entitles this fine bird to a place in the island list: "On the 24th September, 1849, being two days after the occurrence of an extraordinary flight of the Swallow tribe, I happened to be skirting the shore of Hungry Bay in search of novelties, when, peering through the roots of the belt of mangrove trees by which the shallow water of the bay is surrounded, a large white, or greenish-white, bird, which I took to be some tall species of Heron, was discovered standing in a very upright position within long shot of me. In the hurry of the moment I unfortunately discharged the barrel of my gun which was loaded with small shot, and the stranger was soon afterwards seen topping the mangroves in an easterly direction.

"Two days afterwards I met Stone, the town constable, who was in pursuit of the tall white bird when I fired at it, and, from being concealed among the mangroves, had a fair opportunity of observing its form and appearance, who confidently asserted that it was 'no Heron.' He described the bird as brownish-white in plumage with a very long neck, equally long legs, and a peculiar bill something like a parrot's. Referring to Wilson's print of the Wood Ibis (*Tantalus loculator*), he at once said it was too long in the bill and too heavy in the formation of the neck and body for the bird he saw. His eye then caught sight of Wilson's figure of the Flamingo, which he said was precisely the shape and make of the bird in question, and the form of the bill exactly similar. Now, the only part of the tall stranger concealed from my observation was the head; I have therefore no doubt whatever, judging from Stone's testimony, and from what I observed myself, that this bird was a Flamingo in the immature greyish-white plumage of the first year. Stone informed me that he followed this Flamingo to Peniston's Pond, distant about two miles, where he shot at it without success. As the bird was not met with afterwards it no doubt took its departure from the Bermudas."

Family ANATIDÆ.

Sub-family CYGNINÆ.

Genus CYGNUS, Linn.

139. *Cygnus americanus*, Sharpless. American or Whistling Swan.

Cygnus musicus, Bp., Linsl.
Cygnus bewickii, Sw. & Rich., Nutt.
Cygnus ferus, Nutt.
Cygnus americanus, Sharpless, Aud., Gir., Coop. & Suck., Bd., Coues & Prent., Coues, Lawr., and authors generally.
Olor americanus, Bp.

Length, 55; wing, 22.00; tarsus, 4.25.

Hab.—Continent of North America; breeding only in the far north; wintering in United States. (Coues.)

One was shot in White's Marsh, near Hamilton, in 1835 or 1836, as related to Mr. Hurdis by credible witnesses in 1850. It was observed in the marsh for three or four days before it was obtained (by a man named Dunscomb), and was by no means shy or difficult of approach. It was sold, as might have been expected, as an article of food, and realized the sum of $3. (Hurdis.)

Hab.—Eastern North America, especially along the Atlantic coast, from Labrador to Texas; Iowa, Kansas, Cuba. (Coues.)

Usually visits Bermuda in small numbers in the autumn, remaining till the end of January or even later. A flock of twenty frequented Harrington Sound and Peniston's Pond from Christmas, 1871, to February 15, 1872 (J. M. Jones). Specimens were obtained by Lieutenant Denison and myself in January, 1875, when there were a good many about. They are always very shy, and when disturbed frequently fly a long way out to sea.

Genus DAFILA, Leach.

144. *Dafila acuta*, (Linn.) Bp. Pintail.

Anas acuta, Linn., Gm., Lath., Temm., Boie, Licht., Less., Flem., Brehm., Wagl., Jen., Keys. & Blas., Degl., Schl., Wils., Bp., Nutt., Aud., Gir.
Dafila acuta, Bp., Gray, Gosse, Reich., Cass., Bd., Cab., Scl., Heerm., Coop. & Suck., Newton, Hayd., Jerd., Coues, and authors generally.
Querquedula acuta, Selby.
Anas sparmannii, Lath.
Anas caudacuta, Pall., Leach.
Dafila caudacuta, Steph., Gar., Eyt.
Querquedula caudacuta, Macgill.
Anas longicauda, Briss., Brehm.
Anas caudata, Brehm.
Dafila acuta, var. *americana*, Bp.

Length, 30; wing, 11; tail, 8.60; tarsus, 1.75.

Hab.—North America and Europe; breeds chiefly in high latitudes; in winter south to Panama; Cuba. (Coues.)

Several specimens were obtained, all in immature plumage, in the winter of 1847–'48. Mr. Bartram has a male in full plumage, shot by himself near St. George's. A female was shot by Gibbs in Smith's Marsh on the 26th October, 1875, as recorded by Lieutenant Denison, Royal Engineers.

Genus CHAULELASMUS, Gray.

145. *Chaulelasmus streperus*, (Linn.) Gray. Gadwall.

Anas strepera, Linn., Gm., Lath., Wils., Temm., Boie, Bp., Steph., Flem., Brehm., Nutt., Aud., Naum., Keys. & Blas., Gir., De Kay, Schl., Degl., Swin., and of most earlier authors.
Anas (*Chauliodus*) *strepera*, Sw. & Rich., Gen., Sw.
Chauliodus strepera, Sw., Eyt.
Chaulelasmus streperus, Gray, Bp., Gosse, Reich., Bd., Heerm., Jerd., Coues, Dress., and of authors generally.
Querquedula strepera, Macgill.
Anas strepera americana, Maxim.
Chaulelasmus americana, Bp.

Length, 22; wing, 10.50; tarsus, 1.64.

Hab.—North America generally; Europe, Asia, Africa. (Coues.)

A female Gadwall was captured alive in December, 1849, and was in the possession of Mr. Hurdis till May, 1851, associating with some tame ducks and laying several nests of eggs, none of which, however, proved fertile (Nat. in B., p. 47).

Genus MARECA, Steph.

146. ***Mareca americana*, (Gm.) Steph. American Wigeon.**

Anas americana, Gm., Lath., Wils., Bp., Nutt., Aud., Gir., Schl., Finsch.
Mareca americana, Steph., Sw. & Rich., Sw., Bp., Eyt., Gray, Gosse, Bd., Cab., Cass., Scl., and late authors generally.
Mareca penelope β, Blas.

Length, 21.75; wing, 11; tarsus, 1.42.

Hab.—North America, south of Guatemala; Cuba. Accidental in Europe. (Coues.)

After a revolving gale in October, 1854, several of these birds were shot and brought for examination to Mr. Hurdis, who obtained one himself in the following month (Nat. in B., p. 49). Two were shot at Devonshire Bay by Corporal Alder, Royal Engineers, in October, 1874.

Genus QUERQUEDULA, Steph.

147. ***Querquedula carolinensis*, (Gm.) Steph. Green-winged Teal.**

Anas crecca var., Forst.
Anas (*Boschas*) *crecca var.*, Sw. & Rich., Nutt.
Anas crecca, Wils, Bp., Aud.
Anas carolinensis, Gm., Lath., Aud., Gir., Reinh., Maxim., Trippe.
Querquedula carolinensis, Steph., Eyt., Bp., Gray, Bd., Cass., Scl., Scl. & Salv., Coues.
Nettion carolinensis, Bd., Coop. & Suck., Coues, Hayd., Cab., Scl., Dress., Gundl., and of late American authors.
Anas americana, Vieil.

Length, 14; wing, 7.40; tarsus, 1.14.

Hab.—Whole of North America; Greenland, Mexico, Cuba; south to Honduras. (Coues.)

This is an occasional visitor in autumn. One was shot at Peniston's Pond on October 10, 1874, and a few days later I stalked another in vain at the same place. Captain Rooke, Fifty-third Regiment, shot one in Devonshire Swamp in November, 1874. I am not aware of the occurrence of the European *Q. crecca*, or common Teal, in Bermuda. It occurs as a straggler in North America.

Lieutenant Denison informs me that four examples of *Q. carolinensis* were shot by Lieutenant Tallents, Twentieth Regiment, in the autumn of 1875

148. *Querquedula discors*, (Linn.) Steph. Blue-winged Teal.

Anas discors, Linn., Gm., Lath., Wils., Vieil., Bp., Wagl., Aud., Gir., DeKay, Trippe, Schl.
Anas (Boschas) discors, Sw. & Rich., Nutt.
Querquedula discors, Steph., Gray, Bd., Cab., Scl., Scl. & Salv., Dress., Verr., Lawr., Sund., Coues, Dall & Bann., Allen, Trippe.
Cyanopterus discors, Eyt., Bp., Gosse, Blas.
Pterocyanea discors, Bp., Gray, Newb.

Length, 16; wing, 7.10; tarsus, 1.20.

Hab.—North America, chiefly east to Rocky Mountains; to the Pacific Coast in Alaska; West Indies, Mexico, Central and South America to Ecuador. (Coues.)

A frequent visitor on its way south, but rarely seen on its northward journey; most numerous in October. Nine couple were killed in Pembroke Marsh after the gale of the 22d October, 1854, and many more at St. David's Island, where a native sportsman is said to have killed sixteen couple during the gale (Hurdis). I obtained several specimens in October and November, 1874, and saw two, one of which I knocked down, but unfortunately lost, in the mangrove swamp near the Sluicegates, on April 30, 1875.

Genus SPATULA, Boie.

149. *Spatula clypeata*, (Linn.) Boie. Shoveller.

Anas clypeata, Linn., Scop., Gm., Lath., Ill., Pall., Vieil., Brehm, Licht., Wils., Temm., Bp., and of earlier authors generally.
Spatula clypeata, Boie, Gray, Cass., Bd., Scl., Cab., Coop. & Suck., Hayd., Lawr., Coues, and most late writers.
Spathulea clypeata, Flem.
Rhynchaspis clypeata, Leach., Steph., Sp.
Anas rubens, Gm., Lath.

Length, 20; wing, 9.50; tarsus, 1.38.

Hab.—North America, Europe, Asia, Australia, southward to Guatemala, Cuba, Jamaica, Mexico. (Coues.)

"A single female specimen was shot in December, 1844, by Mr. C. B. Fozard" (Nat. in B., p. 47).

Genus AIX, Boie.

150. *Aix sponsa*, (Linn.) Boie. Wood Duck; Summer Duck.

Anas sponsa, Linn., Gm., Lath., Wils., Vieil., Licht., Steph., Bp., Nutt., Aud., Vig., Gir., Keys. & Blas., De Kay, Maxim.
Aix sponsa, Boie, Eyt., Bp., Gray, Gosse, Cab., Bd., Coop. & Suck., Verr., Coues, Hayd., Dress., and most late writers.
Dendronessa sponsa, Sw. & Rich.
Lampronessa sponsa, Wagl.
Cosmonessa sponsa, Reich.

Length, 19; wing, 9.50; tarsus, 1.40.

Hab.—North America, especially United States; breeding throughout in suitable places, and wintering chiefly in the south; Cuba (Coues).

"A female bird of this species was shot by Dr. Cole, Twentieth Regiment, on the 16th December, 1846" (Nat. in B., p. 48).

Sub-family FULIGULINÆ.

Genus FULIGULA, Steph.

151. *Fuligula affinis*, Eyt. Lesser Scaup Duck; Blue-bill.

Anas marila, Forst.
Fuligula marila, Aud.
Fuligula affinis, Eyt., Gosse, Turnb., Coues.
Marila affinis, Bp.
Fulix affinis, Bd., Scl., Lawr., Dress., Salv., Newton, Dall & Bann., Coues & Prent., Verr., Coues, Mayn., Aiken.
Fuligula mariloides, Vig.
Fuligula minor, Gir., Bell.

Length, 16.50; wing, 8; tarsus, 1.34.

Hab.—The whole of North America, and south to Guatemala in winter; part of the West Indies (Coues).

To make matters clear, in treating of this species, I must call in the aid of Dr. Coues, who says, in his "Birds of the Northwest" (p. 574): "Authors are at variance concerning the relationship of the bird to the preceding (*F. marila*), and the question is not yet settled. For myself I am rather inclined to keep the two apart, notwithstanding their very close resemblance, and admitting the probability that intermediate examples may be found. There appears to be something different in their range, the *F. affinis* being the more southerly. Not that it does not in the breeding season reach as high latitudes as the other, but that its autumnal movement is pushed to the West Indies and Central America, where the true *F. marila* is not recorded as occurring. It is improbable that two varieties, if they be really such, should preserve this difference." Armed with this authority, I think I may safely refer the specimens of the Scaup chronicled in "The Naturalist in Bermuda," all of which measured only 16 to 16½ inches in length, to this smaller species, *F. affinis*. The length of *F. marila* varies from 19 to 20½ inches. The specimens alluded to are one killed by Mr. C. Abbott, Twentieth Regiment, on the 19th December, 1846, and two others by Colonel Wedderburn, at Warwick Pond, on the 8th January, 1849. Lieutenant Denison, Royal Engineers, shot a female specimen at Tucker's Town on the 25th February, 1876, measuring 16 inches in length.

152. *Fuligula collaris*, (Don.) Bp. Ring-necked Duck.

Anas collaris, Donovan.
Fuligula collaris, Bp., Gray, Blas., Schl., Degl., Gerbe, Turnb., Coues.
Fulix collaris, Bd., Bryant, Verr., Coues, Salv., Dress., Gundl., Aiken, Trippe, Snow, and of most United States writers.
Marila collaris, Bp.
Anas fuligula, Wils., Temm.
Anas (*Fuligula*) *rufitorques*, Bp.
Anas rufitorques, Ord, Schl.
Fuligula rufitorques, Bp., Sw. & Rich., Nutt., Aud., Eyt., Gir., De Kay, Gosse, Cass., Maxim.

Length, 18; wing, 8; tarsus, 1.28.

Hab.—The whole of North America, breeding far north, wintering in United States and beyond; south to Guatemala; Cuba; Jamaica; accidental in Europe (Coues).

One was captured, and kept for a short time alive, by Mr. Hurdis, on the 13th November, 1850. He was anxious to watch the change of the plumage, but the poor bird fell a victim to a cat (Nat. in B., p. 50).

Genus AYTHYA, Boie.

153. *Aythya vallisneria*, (Wils.) Boie. Canvas-back Duck.

Anas vallisneria, Wils., Dought.
Fuligula vallisneria, Steph., Bp., Sw. & Rich., Nutt., Eyt., Aud., Gir., De Kay, Coues.
Aythya vallisneria, Boie, Bp., Newb., Bd., Coop. & Suck., Dress., Salv., Dall & Bann., and most late writers.
Nyroca vallisneria, Gray, Woodh., Heerm.
Aristonetta vallisneria, Bd.
Anas vallisneriana, Sab.

Length, 20.10; wing, 9.30; tarsus, 1.70.

Hab.—Whole of North America; breeds from Northern States northward; winters from Middle States southward to Guatemala (Coues).

Mr. Hurdis purchased a specimen of this Duck from some boys, by whom it was captured alive in a marsh near James's Cottages, on the 30th October, 1851. It was destroyed by ants soon afterwards. On the 23d November following he observed a very fine specimen in White's Marsh.

Genus CLANGULA, Flem.

154. *Clangula glaucion*, Brehm. Golden-eye.

Anas clangula, Linn., Scop., Forst., Gm., Lath., Ill., Wils., Temm., Leach., Vieil., Naum., Schl., Swinh.
Clangula clangula, Boie.
Glaucion clangula, Kaup, Keys. & Blas.
Fuligula clangula, Bp., Nutt., Aud., Gir., Degl., Maxim., Finsch.
Bucephala clangula, Coues.

Anas glaucion, Linn., Gm., Lath.
Clangula glaucion, C. L. Brehm, Bp., Gray.
Clangula vulgaris, Flem., Sw. & Rich., Sw., Eyt.
Clangula americana, Bp., Eyt., Gray, Newb.
Bucephala americana, Bd., Coop. & Suck., Verr., Coues, Blak.

Length, 18.75; wing, 8.50; tarsus, 1.50.

Hab.—Whole of North America, Cuba, Europe (Coues); Northern Asia (Dresser).

"A male specimen was shot on the 10th April, 1854, in Pembroke Marshes" (Nat. in B., p. 49). There were several of these Ducks about the islands in the winter of 1874–'75, and I succeeded in obtaining two, both males, in immature plumage, at Peniston's Pond, on the 29th December, 1874, and 5th February following. A flock of seven frequented Shelly Bay Marsh, and were also seen by Lieutenant Hussey in the Great Sound, but I am not sure that any other specimens were procured. Lieutenant Denison records one shot in Devonshire Swamp on 22d January, 1876.

155. *Clangula albeola*, (Linn.) Steph. Buffle-head; Butter-ball.

Anas albeola, Linn., Forst., Gm., Lath., Wils., Schl.
Fuligula albeola, Bp., Nutt., Aud., Gir., De Kay, Schl.
Clangula albeola, Steph., Boie, Sw. & Rich., Jen., Eyt., Bp., Vig., Gray, Bd., Heerm., Reinh., Newton, Hart.
Bucephala albeola, Bd., Coop. & Suck., Dress., Coues, Dall & Bann., Aiken, Coues, and most late writers.
Anas bucephala, Linn., Gm.
Anas rustica, Linn., Gm.

Length, 15; wing, 6.65; tarsus, 1.25.

Hab.—North America; Mexico; Cuba; Greenland; accidental in England (Coues).

One was obtained in Pembroke Marsh in December, 1845, and others have been occasionally observed subsequently. A male was shot by Lieutenant Tallents, Twentieth Regiment, at Peniston's Pond in November, 1875 (Denison).

Genus ŒDEMIA, Flem.

156. *Œdemia perspicillata*, (Linn.) Steph. Surf-Scoter.

Anas perspicillata, Linn., Forst., Gm., Lath., Wils., Temm., Vieil., Naum., Schl.
Oidemia perspicillata, Steph., Flem., Sw. & Rich., Gm., Sw., Bp.. Keys. & Blas., Gray, Gosse, Cass., Reinh., Newton, Coues, Hart.
Pelionetta perspicillata, Kaup, Reich, Bp., Bd., Coop. & Suck., Coues, Verr., Blak., Lawr., Dall & Bann.
Fuligula perspicillata, Aud., De Kay, Gir., Degl.

Length, about 20; wing, 9.50; tail, 3.6; tarsus, 1.8.

Hab.—North America, coastwise; Jamaica; Europe, rare (Coues).

Two recorded in "The Naturalist in Bermuda"—one killed with a stick in Hamilton Harbor on the 8th January, 1849, and another shot in Pembroke Marsh on the 7th October, 1854. Lieutenant Hussey, Royal Engineers, shot one (a female) on a small pond near the lighthouse, on the 17th November, 1874, and kindly presented it to me.

Sub-family ERISMATURINÆ.

Genus ERISMATURA, Bp.

157. *Erismatura rubida*, (Wils.) Bp. Ruddy Duck.

Anas rubida, Wils., Sab.
Anas (*Fuligula*) *rubida*, Bp.
Fuligula (*Oxyura*) *rubida*, Bp.
Fuligula (*Gymnura*) *rubida*, Nutt.
Fuligula rubida, Sw. & Rich., Aud., Gir., De Kay, Lemb.
Erismatura rubida, Bp., Eyt., Gray, Bd., Scl., Heerm., Verr., Coues, Gundl., Stev.
Biziura rubida, Schl., Giebel.
Anas jamaicensis, Ord.

Length, 16.00; wing, 5.80; tarsus, 1.26.

Hab.—North America, at large; south to Guatemala, where found breeding at Dueñas; Cuba (Coues).

A young male of this species was shot by Dr. Cole, in a marsh near Hamilton, on the 24th November, 1846.

Sub-family MERGINÆ.

Genus MERGUS, Linn.

158. *Mergus merganser*, Linn. Goosander.

Mergus merganser, Linn., Gm., Lath., Wils., Temm., Bp., Flem., Jen., Sw. & Rich., Nutt., Aud., Gir., Naum., Schl., and authors generally.
Mergus castor, Linn., Gm., Lath., Keys. & Blas., Gray.
Merganser castor, Bp., Macgill.
Merganser castor var. *americanus*, Bp.
Merganser raii, Leach.
Merganser gulo, Steph., Leach.
Mergus americanus, Cass., Bd., Coop. & Suck., Hayd., Dall, Dall & Bann., Snow, Finsch, and of many late United States writers.

Length, 26.50; wing, 11.00; tarsus, 1.84.

Hab.—North America; Asia; Europe (Coues).

Included in Colonel Wedderburn's list as having been seen, but not obtained.

159. *Mergus serrator*, Linn. Red-breasted Merganser.

Mergus serrator, Linn., Gm., Lath., Pall., Ill., Wils., Temm., Boie, Licht., Brehm, Bp., Flem., Sw. & Rich., Nutt., Aud., Keys. & Blas., Naum., Gray, Schl., and nearly all authors.
Merganser serrator, Vieil., Steph., Bp.
Mergus niger, Gm.
Mergus cristatus, Brunn.
Mergus leucomelas, Brehm.

Length, 23.25; wing, 8.60; tarsus, 1.80.

Hab.—Northern hemisphere (Coues).

Mr. Bartram has an undoubted specimen, obtained by him near St. George's.

160. *Mergus cucullatus*, Linn. Hooded Merganser.

Mergus cucullatus, Linn., Gm., Lath., Bp., Sw. & Rich., Nutt., Jen., Aud., Eyt., Keys. & Blas., Temm., Gray, Schl., Gir., Cass., Scl., Coues.
Merganser cucullatus, Steph., Bp., Macgill.
Lophodytes cucullatus, Reich., Bp., Bd., Scl., Coop. & Suck., Verr., Coues, Gundl., Dress., Dall & Bann., Allen, and of many writers.

Length, 17.50; wing, 7.90; tarsus, 1.20.

Hab.—Whole of North America; Europe; Cuba (Coues).

A female was caught near Ireland Island by one of the crew of H. M. S. Scourge, on the 10th of January, 1849, and one was shot near St. George's on the 23d December, 1850. A third example was obtained by Mr. Bartram, and is now in his collection.

Order STEGANOPODES.

Family SULIDÆ.

Genus SULA, Briss.

161. *Sula fiber*, Linn. Booby Gannet.

Pelecanus fiber, Linn.
Pelecanus sula, Linn.
Dysporus sula, Ill., Bp.
Sula brasiliensis, Spix.
Sula fusca, Vieil., Bp., Nutt., Aud.

Length, 31.00; wing, 16.50; tarsus, 1.70; tail, 8.50.

Hab.—Gulf of Mexico; Atlantic coast from Georgia southward (Baird).

Colonel Wedderburn records the occurrence of one of these birds, which flew into one of the barrack-rooms at Fort Catherine on October 3, 1847. Another, in Mr. Bartram's collection, was shot by an officer with a revolver, curiously enough, very near the same fort, and a young bird in Lieutenant Denison's collection was caught alive on the rocks near Fort Cunningham (at no great distance from Fort Catherine) on the 26th September, 1875, living for a short time in confinement.

Family PELECANIDÆ.

Genus Pelecanus, Linn.

162. ***Pelecanus fuscus***, **Linn. Brown Pelican.**

Pelecanus fuscus, Linn., Bp., Nutt., Aud.
Leptopelicanus fuscus, Reich.
Onocrotalus fuscus, Bp.

Length, 56; wing, 22; bill, 13.50; tarsus, 3; tail, 6.50.

Hab.—From Texas to North Carolina; California coast (Baird).

Two examples are recorded by Colonel Wedderburn, who says (Nat. in B., p. 51): "One of these birds was shot at Hungry Bay, many years ago; and another was killed near St. George's in April, 1850, which was given to me by Colonel Drummond."

Family PHALACROCORACIDÆ.

Genus Graculus, Linn.

163. ***Graculus dilophus***, **(Sw.) Gray. Double-crested Cormorant.**

Pelecanus (*Carbo*) *dilophus*, Sw. & Rich.
Carbo dilophus, Gamb.
Phalacrocorax dilophus, Nutt., Bp., Aud., Gir., Bd.
Graculus dilophus, Gray, Bp., Bd., Coop. & Suck., Coues, Allen, Verr., Lawr., Dall & Bann., Ridg.
Phalacrocorax floridanus, Maxim.

Length, 33; wing, 13; tail, 6.75; bill, 2.85; tarsus, 3.50.

Hab.—North America at large, in the interior as well as coastwise (Coues).

Three instances of the occurrence of this species are recorded in "The Naturalist in Bermuda," viz, one shot by Captain Orde, at Pitt's Bay, on the 10th October, 1847; one by Colonel Wedderburn, on Grace's Island, on the 8th February, 1848; and another, mentioned by Mr. Hurdis, which frequented the islands for some little time, but was not obtained. There is a specimen in Mr. Bartram's collection, and another in that of Mr. Lane, of Hamilton. There were several of these birds about the islands in the winter of 1874–'5, but they were so wary that none were obtained. One was repeatedly seen, and once fired at, in the Great Sound; one attached itself to St. George's Harbor; and a pair frequented the "Stag" Rocks, near Shelly Bay, all the winter, conspicuous to the passers-by as they sat in solemn security on their accustom
pinnacle. I tried in vain to obtain one of these, but never got a s
One of them flew close over my head one morning, I

gun in my hand at the moment. One was shot, as recorded by Lieutenant Denison, Royal Engineers, at Basden's Pond, in the autumn of 1875.

Family TACHYPETIDÆ.

Genus TACHYPETES, Vieil.

164. *Tachypetes aquilus*, Vieil. Frigate Bird; Man-of-War Bird.

Tachypetes aquilus, Vieil., Bp.
Pelecanus aquilus, Linn., Nutt., Aud., Gamb.
Attagen aquila, Gray.

Length, 41; wing, 25; bill, 5.50; tail, 18; tarsus, .8.

Hab.—Texas to Florida; California (Baird).

Two were obtained at Ireland Island, on the 27th and 30th September, 1848, respectively, by Colonel Wedderburn. One was shot by Captain Clutterbuck, of the fifty-sixth regiment, on September 30, 1852, and another by Captain Tolcher, of the same regiment; on April 2, 1854. Mr. Bartram has three specimens in his collection, obtained by himself. The latest of these he shot in October, 1876, when there was a very strong gale from the northwest, lasting some days, and a great influx of Terns, Frigate-Birds, Ospreys, &c.

Family PHAËTONIDÆ.

Genus PHAËTON, Linn.

165. *Phaëton flavirostris*, Brandt. Yellow-billed Tropic Bird.

Lepturus candidus, Briss., Bp.
Phaëton candidus, Gray.
Phaëton æthereus, Bp., Nutt., Aud.
Phaëton flavirostris, Brandt, Scl.

Length, 30; wing, 11; tail, 18.50; bill, 2.05; tarsus, .9.

Hab.—Florida coast (Baird); Cuba; Bermuda.

The geographical distribution of the three known species of Tropic-bird, *P. æthereus*, *P. flavirostris*, and *P. rubricauda*, seems not yet well defined, and no doubt their extensive wanderings will render any attempt at precise limitation extremely difficult, certainly until we are in possession of a larger series of observations than at present. *P. flavirostris* (the "Boatswain-bird" or "Long-tail" of the Bermudas) is a familiar and abundant summer visitor to the islands, arriving at the end of February or beginning of March, and departing early in October. An occasional straggler is said to have been seen in Bermudian waters in winter time, presumably an early arrival, or backward young bird

left behind. One was shot as far north as the coast of Nova Scot
after a violent gale from the south, on the 4th September, 1870. I s
this bird in the Halifax Museum. The excellent accounts of the hal
and nidification of this species given by Mr. Hurdis and Colonel W
derburn have left me but little to say. The single egg, which in co
ing is not unlike that of a Kestrel, is deposited in holes in the ro
always in those which have a flooring of sand, preference being give
steep and overhanging cliffs on the south shore and the islands ab
Castle Harbor. A few pairs nest on the northern shore, where the cl
are much lower. Sometimes one can see the sitting bird's long t
feathers protruding from the nest; while in another case the nest m
be so far in, horizontally, that one can only tell there is one by
harsh grating cry of the disturbed occupant. Both male and fem
sit, fighting vigorously with their formidable bills in defense of th
home. The young also show fight; in fact, the species is peculia
fierce and untamable. Three young ones I kept alive for about t
months maintained their savage nature till the last, refusing to f
themselves, striking viciously at any one who approached them, a
even at one another. Their flight is peculiar, but graceful, and th
never seem tired of their perpetual wheeling and maneuvering. T
take beautiful headers, like a Tern or Gannet, in pursuit of small fi
It is rare to meet with a specimen possessing two good long central t
feathers; one is generally smaller and shorter than the other. So
of these feathers are of a lovely orange-pink. They get rubbed
during incubation, and may be picked up near the breeding pla
Two broods are reared, fresh eggs being found as early as the 1
April, and again at the end of June; there are intermediate examp
probably laid by birds whose first nests have been visited by
spoiler. That these birds revisit their breeding stations year after y
is, I think, clearly shown by the following circumstance: Mr. Bartr
by way of experiment, slit the two webs of one foot, and cut off on
two claws, of a young bird in a nest near his house. Next year t
bird turned up again, and made its nest close to the same spot. T
attachment to the family residence is, I fancy, far from unusual w
migratory birds. Swallows and other familiar visitors to England
known to possess it in a marked degree. On a calm day the bri
greenish blue tint of the Atlantic waters, as they gently rise and
above the white sands below, is reflected on the glossy white brea
and under parts of the Tropic-birds in a most remarkable manner

they cruise about, at no great height, along the shores or among the islands. During the breeding season the parent birds "off duty" are to be seen in the neighborhood of their nesting places all the morning till about noon, when the greater part disappear in a rather mysterious manner. I came to the conclusion that they proceed to a considerable distance out to sea, returning at dusk, and this opinion was much strengthened by seeing two old birds sitting on the water one afternoon, at least 100 miles from the Bermuda shores. This was during a voyage from Bermuda to New York, on the 7th August, 1874, when the second "young hopeful" had probably left, or was about to leave, the nest, and therefore does not prove much; but it shows that these strong-winged birds, who would probably do their 100 miles in three hours, or even less, *do* travel to such distances from land long before they have thought of quitting their breeding haunts. In Castle Harbor, where there are a great number of Tropic-birds continually on the wing, and where they are left comparatively undisturbed during the daytime, this disappearance is, or appears to be, on a somewhat smaller scale.

Order LONGIPENNES.

Family LARIDÆ.

Sub-family LARINÆ.

Genus LARUS, Linn.

166. *Larus marinus*, Linn. Great Black-backed Gull.

> *Larus marinus*, Linn., Gm., Lath., Temm., Boie, Steph., Flem., Bp., Nutt, Brehm., Jen., Eyt., Aud., Naum., Keys. & Blas., Schl., Gray, Lawr., Coues., Verr., and of other authors.
> *Dominicanus marinus*, Bruch, Bp.
> *Larus niger*, Briss.
> *Larus nævius*, Linn., Gm., Lath.
> *Larus albus*, Müll.
> *Larus maculatus*, Bodd.
> *Larus maximus*, Leach, Brehm.

Length, 30; wing, 18.50; bill, 2.50; tarsus, 3.

Hab.—American and European coasts of the Atlantic; south in winter to Long Island, Great Lakes, and Mississippi (Coues).

Mr. Hurdis mentions an immature example of this Gull, which was captured alive in the Great Sound in December, 1851, and Mr. Bartram has a fine specimen, also in immature plumage, shot by himself near Stocks Point, on the 27th December, 1862.

167. *Larus argentatus*, Gm. Herring Gull.

Larus fuscus, Penn., Mont.
Larus argentatus, Gm., Schl., Gundl., Hartl., Dress., Coues.
Larus marinus, var. β, Lath.
Larus glaucus, Retz., Meyer & W.
Larus cinereus, Leach.
Larus argentatoides, Brehm.
Larus argenteus, Macgill.
Laroides major, argentatus, argenteus, argentatoides et *argentaceus*, Brehm.
Glaucus argentatus, argentatoides, Bruch.
Larus marinus, Gundl., Lemb.
Larus smithsonianus, Coues.

Length, 23; wing, 18; tail, 7.50; bill, 2½; tarsus, 2½.

Hab.—Northwest Europe; Baltic; western coasts down to North Africa; Azores; Madeira; Canaries; Greenland; Hudson's Bay; Labrador; down the coast as far as Texas; Cuba; Bermuda. (Saunders.)

These Gulls occur frequently, not regularly, and many specimens have been obtained. One in my collection was shot in Devonshire Bay on the 4th November, and they have been seen as late as the 19th March. They were numerous in the autumn of 1875, and Lieutenant Denison obtained several specimens, all immature.

Larus occidentalis, Aud., has been included in the Bermuda lists by Colonel Wedderburn (Nat. in B., p. 54), but I think the geographical distribution of this species [Pacific Coast of North America (Saunders), (Coues)] precludes all possibility of its having occurred in the islands.

168. *Larus delawarensis*, Ord. Ring-billed Gull.

Larus delawarensis, Ord, Lawr., Coop. & Suck., Coues, Verr., Schl., Allen.
Larus canus, Bp., not of authors.
Larus zonorhynchus, Rich., Nutt., Aud., Gir., Bp., Blas.
Glaucus zonorhynchus, Bruch.
Gavina zonorhyncha, Bp., Bruch.
Gavina bruchii, Bp., Bruch.

Length, 19.75; wing, 14.75; bill, 1.70; tarsus, 2.05.

Hab.—North America; generally throughout the interior as well as coastwise; Cuba (Coues).

Only one on record killed by Colonel Wedderburn, near the Dockyard, on the 1st January, 1849, during a northwesterly gale.

169. *Larus atricilla*, Linn. Laughing Gull.

Larus atricilla, Linn., Temm., Steph., Flem., Bp., Nutt., Gm., Aud., Keys. & Blas., Gir., Schl., Gray, Pelz., Sund., Scl. & Salv., Coues.
Xema atricilla, Boie, Bp., Cab.
Gavia atricilla, Macgill.; Blas.
Chroicocephalus atricilla, Lawr., Scl., Newton, Bryant, Coues, Verr., Allen, Dress., Gundl.
Larus ridibundus, Wils., Léot.
Atricilla catesbyi, Bruch.

Length, 16.50; wing, 13; tail, about 5; bill, 1.75; tarsus, 2.

Hab.—America, from Maine on the east coast down to the mouth of the Amazons and the West Indian Islands; on the west coast, California, Mexico, Guatemala, and as far south as the northern frontier of Peru. (Saunders.)

One seen, flying close past him, by Colonel Wedderburn, at Ireland Island. Mr. Hurdis records that one was taken alive by a fisherman in the winter of 1851–'52, and was confined for some time in a spare room, eventually effecting its escape.

170. *Larus philadelphia*, (Ord.) Gray. Bonaparte's Gull.

Sterna philadelphia, Ord.
Chræcocephalus philadelphia, Lawr., Coop. & Suck., Coues, Verr., Allen, Dall & Bann., Mayn., Newt.
Larus philadelphia, Gray, Hart., Coues, Ridg., Saunders.
Larus philadelphious, Turnb.
Larus capistratus, Bp.
Larus bonapartei, Rich., Nutt., Aud., Jerd., Schl.
Xema bonapartei, Bp.
Chroicocephalus bonapartei, Bruch.
Gavia bonapartei, Bp., Blas.

Length, 14; wing, 10.25; bill, 1.20; tarsus, 1.40.

Hab.—British North America and Alaska; breeding on the Yukon, and in neighboring localities. In autumn descends as far as California on the west and North Carolina on the east coast; Bermuda. Accidental in the British Islands. (Saunders.)

Three are recorded by Colonel Wedderburn. One was shot by himself on the 27th January, 1849; a second was seen by him on the 15th December, 1849; and another was killed on the 24th February, 1850. Mr. Bartram obtained two specimens in St. George's Harbor in January, 1876.

Genus Rissa, Leach.

171. *Rissa tridactyla*, (Linn.) Bp. Kittiwake.

Larus rissa, Linn., Gm., Leach, Flem.
Laroides rissa, Brehm.
Larus riga, Gm., Less.
Larus tridactylus, Linn., Gm., Lath., Retz., Nils., Mey. & Wolf, Temm., Vieil., Brehm., Bp., Sw. & Rich., Nutt., Aud., Naum., Keys. & Blas., Schl., Gir., Coues.
Gavia tridactyla, Boie.
Cheimonea tridactyla, Kaup.
Laroides tridactyla, Brehm.
Rissa tridactyla, Bp., Gray, Bruch, Lawr., Coues, Ridg., Verr., Allen, Newt., Dall & Bann., Finsch, Blas., Saunders.
Larus nævius, Schäff.
Larus torquatus et *Larus gavia*, Pall.

States record of wintering (Coues). Cape of Good Hope, Natal, Andaman Islands, Ceylon, Malayan Islands, west coast of Australia. (Saunders.)

The same remarks apply, unfortunately, to this species as to the preceding, it being no longer found, except, perhaps, as an autumn straggler, in the islands. At one time it used to breed in considerable numbers on Gurnet Head Rock (sometimes called the Black Rock). Mr. Hurdis says: "On this rock, difficult of access on account of the ocean swell, as many as 40 or 50 of this elegant species of Tern have been observed in the middle of June, and from the circumstance of both eggs and young having been obtained there on the 1st August, I conclude that it must rear two broods in the season."

Both species were called "Redshanks" by the Bermudians.

176. *Sterna fuliginosa*, Gm. Sooty Tern.

Sterna fuliginosa, Gm., Lath., Wils., Bp., Nutt., Aud., Cab., Lawr., Hartl., Dress., Sund., Hart., Saunders.
Sterna (*Onychoprion*) *fuliginosa*, Gray.
Sterna (*Haliplanes*) *fuliginosa*, Blas.
Sterna (*Haliplana*) *fuliginosa*, Coues.
Onychoprion fuliginosa, Wagl., Gould, Scl., Scl. & Salv.
Haliplana fuliginosa, Wagl., Bp., Coues, Salv., Gundl., Lawr., Allen.
Sterna serrata, Forst.
Hydrochelidon fuliginosum, Bp., Gosse.
Sterna guttata, Forst.
Anous l'herminieri, Less.
Sterna gouldii, Reich.
Sterna luctuosa, Phil. & Laudb.
Thalassipora infuscata, Gray.
Sterna fuliginosa var. *crissalis*, Bd., apud Lawr.

Length, 16.50; wing, 12; tail, 7 to 7.50; bill, 1.80; tarsus, 1.

Hab.—Throughout the warmer portions of the world (Saunders).

Of rare occurrence. Colonel Wedderburn says: "Dr. Cole shot a specimen of this Tern in October, 1846. During the whole time I was quartered in Bermuda I only saw one of these birds, and that in the year 1848. I was walking on the sand-hills, and saw a bird apparently dead on the ground. I put down my gun, and picked the bird up, and was just putting him carefully in paper when my prize thought fit to come to life and flew away, taking me so much by surprise that I never thought of using my gun. It was a most beautiful specimen, and must have been driven on shore by some heavy gale." Mr. Hurdis records that a third example was found in an exhausted state in Devonshire parish, on the 23d October, 1854, after a severe gale the previous day Lieutenant Denison, Royal Engineers, received a you le in cu ous plumage, caught near Paget Quarry, on the south shore, on the 19th September, 1875.

Genus HYDROCHELIDON, Boie.

177. *Hydrochelidon nigra*, (Linn.) Boie. Black Tern.

Sterna nigra, Linn., Mey. & Wolf, Temm.
Sterna nævia, Linn.
Sterna fissipes, Linn., Schl.
Larus merulinus, Scop.
Sterna surinamensis, Gm.
Sterna plumbea, Wils.
Hydrochelidon nigra, Boie.
Viralva nigra, Steph.
Anous plumbea, Steph.
Hydrochelidon fissipes, Gray, Blas., Degl. & Gerbe, Scl. & Salv., Coues.
Hydrochelidon plumbea, Lawr. and other Am. authors.
Pelodes surinamensis, Gray.
Hydrochelidon lariformis, Coues.
"*Sterna cæsia*, Linn.," Gundl.

Length, 9.25; wing, 8.25; tail, 3.75; bill, 1.10; tarsus, .68.

Hab.—Europe, Palestine, and North Africa to the Nile. Across the continent of North America, visiting West Indies and Spanish Main on the one side, and going as far south as Peru and Chili on the Pacific coast in winter (Saunders).

Mr. Bartram obtained the only recorded example of this Tern in St. George's Harbor in October, 1876, after a severe gale from the north-west. It was in company with many other Terns of various species, but only one other, *S. fluviatilis*, was identified.

Genus ANOUS, Leach.

178. *Anous stolidus* (Linn.), Gray. Noddy Tern.

Sterna stolida, Linn., Gm., Lath., Less., Bp., Nutt., Aud., Schl., Hart., Maxim.
Megalopterus stolidus, Boie, Bp., Keys. & Blas.
Anous stolidus, Gray, Cab., Lawr., Scl., Coues, Scl. & Salv., Saunders.
Anous niger, Steph., Eyt.
Gavia leucoceps, Sw.
Sterna pileata, Scop.
Anas rousseaui, Hartl.
Anous fuscatus et spadicea, Steph.

Length, 16; wing, 10 to 10.50; tail, 6; bill, 1.75; tarsus, 1.

Hab.—Ranges from the Gulf coast of North America to the shores of Australia, throughout Polynesia, and occurs in fact in all tropical waters. A straggler to the British seas (Saunders).

A solitary example was killed near Ireland Island by Captain Tolcher, Fifth-sixth Regiment, on the 12th September, 1854.

Family PROCELLARIIDÆ.

Sub-family PROCELLARIINÆ.

Genus OCEANITES, Keys. & Blas.

179. ***Oceanites oceanicus****, Kuhl. Wilson's Petrel.

Procellaria pelagica, Wils.
Procellaria oceanica, Kuhl.
Procellaria wilsoni, Bp.
Thalassidroma wilsoni, Bp., Nutt., Aud.
Thalassidroma oceanica (Kuhl.), Schinz.
Oceanites wilsoni (Bp.), Keys. & Blas.
Oceanites oceanica (Kuhl.), Bp.
Oceanites oceanicus (Kuhl.), Salv.

Length, 7; wing, 5.75; tail, 3; tarsus, 1.3; bill, .65.

Hab.—On both sides of the Atlantic Ocean, and in the Indian Ocean, from the coasts of North America and those of the British Isles down to Kerguelen Land and South Australia, and is by no means uncommon on the ocean off the Azores. (Dresser.)

Colonel Wedderburn says: "I have often seen these birds flying about near the North Rock, and once or twice inside the outer reefs in stormy weather, but never succeeded in shooting any of them." One was shot by Mr. Harford, Fifty-sixth Regiment, some distance from the shore, on the 30th June, 1853. Mr. Bartram's collection contains a specimen, concerning which he writes as follows: "Wilson's Petrel is not such a *rara avis* around the islands as you may be led to think through reading the Naturalist in Bermuda. In May, June, and July there are numbers to be found around the fishing boats a mile or two outside the castle; some days there are ten or twelve flying round, other days none at all. The one that I have was caught by Mr. John Swainson, on St. Catherine's Flat; he was fishing and three or four were flying round the boat and he kept washing in bait; this one came so close that he grabbed it in his hand. At another time it was blowing a strong gale from the northwest, and I saw four so close up to the north shore that the boys threw stones at them. I could have shot them, but if I had I could not have got them." I am not aware that this species has ever been found breeding in Bermuda. I searched in vain for nests, but should not be surprised to hear of them being discovered there some day or other, as the sandy cliffs and débris on the south shore are most suitable for them.

---

* In a letter dated 9th December, 1878, Mr. Bartram informs me that twelve of these Petrels were seen flying about the inside of the Flats Harbor in the middle of October, 1878 (S. G. R).

Genus PUFFINUS, Briss.

180. *Puffinus major*, Fab. Greater Shearwater.

Puffinus major, Fab.
Puffinus cinereus, Bp.
Nectris cinerea, Keys. & Blas.
Cymotomus arcticus, Macgil.
Puffinus arcticus, Macgil.
Ardenna major (Fab.), Reich.
Procellaria major (Fab.), Schl.
Puffinus obscurus, Hart.

Length, 19; wing, 12.16; tail, 4.7; tarsus, 2.38; bill, 2.35.

Hab.—Throughout the whole of the Atlantic Ocean, from the coasts of Greenland to the Cape of Good Hope and Tierra del Fuego (Dresser).

Two obtained by Mr. Hurdis, on the 2d June, 1851; one picked up, unable to fly, in the road on the south side of Hamilton Harbor, and another caught alive in the water near the town of Hamilton. The former measured 19.2 inches in length, with an expanse of wings of 44 inches; the latter was an exact duplicate of it, according to Mr. Hurdis; there is no doubt that the birds belonged to this species, and not to the following one.

181. *Puffinus griseus*, (Gm.) Finsch. Sooty Shearwater.

Nectris fuliginosa, Solander.
Procellaria grisea, Gm.
Procellaria fuliginosa, Forst., Kuhl.
Puffinus fuliginosus, Strick.
Puffinus cinereus, Gould.
Nectris fuliginosa, Keys. & Blas.
Puffinus major, Temm.
Procellaria tristis, Forst.
Puffinus tristis (Forst.), Gray.
Nectris amaurosoma, Coues.
Puffinus amaurosoma (Coues), Gray.
Puffinus griseus (Gm.), Finsch.

Length, 16; wing, 11.85; tail, 3.7; tarsus, 2.22.

Hab.—In the Atlantic from the coast of Grëenland to the extreme south; in the Pacific from the coast of California down at least to Chili, and off the coast of New Zealand. (Dresser.)

One specimen in Mr. Bartram's collection obtained by himself.

182. *Puffinus anglorum*, Temm. Manx Shearwater.

Procellaria puffinus, Linn.
Procellaria anglorum, Temm.
Puffinus anglorum (Temm.), Boie.
Puffinus arcticus, Faber.
Procellaria yelkouan, Acerbi.
Thalassidroma anglorum (Temm.), Sw.

Nectris puffinus (Linn.), Keys. & Blas.
Nectris obscura, Keys. & Blas.
Cymotomus anglorum (Temm.), Macgil.
Puffinus obscurus, Bp.
Puffinus barolli (Bonelli), Bp.
Puffinus yelkouan (Acerbi), Bp.
Procellaria yelkuan (Acerbi), Schl.
Puffinus yelcuanus (Acerbi), Coues.
Nectris anglorum (Temm.), Rey.
Nectris baroli, Rey.

Length, about 13; wing, 9.3; tail, 3.2; tarsus, 1.9; bill, 1.6.

Hab.—North Atlantic Ocean, not ranging into the Baltic, but in the Mediterranean as far as the Black Sea. On the American coast from Labrador down to New Jersey. [illegible] er.)

A specimen in Mr. Bartram's collection, captured while sitting on its solitary egg in a rocky hole on a small island in Castle Harbor, in April, 1864. The egg was unfortunately broken. There is no record of the bird's breeding on any other occasion, nor of any other specimens being obtained; but it is quite possible that it, as well as Wilson's Petrel and other *Procellaridæ*, may formerly have frequented the islands in numbers, and that an occasional pair may revisit their old haunts. Such birds would, from their habits, be but little noticed by any but fishermen.

183. *Puffinus obscurus*, Gm. Dusky Shearwater; "Cahow;" "Pemblyco."

Procellaria obscura, Gm.
Puffinus obscurus, Lath., Bp., Nutt., Aud.
"*Puffinus l'herminieri*, Less."

Length, about 12; wing, 7½ to 8; tail, 4½; bill, 1¼; tarsus, 1⅝.

Hab.—Tropical regions in Atlantic and Pacific Oceans.

Since Mr. Hurdis, in 1849, identified the "Cahow" or "Cowhow" of the historians of Bermuda with this interesting species, very few observations have been made on the few pairs still frequenting the islands. That the poor "Cahow" has almost ceased to breed there is a melancholy fact. Formerly it was plentiful, and even within the last fifteen years, Mr. Bartram informs me, there were many nests in the isolated rocks, both on the north and south shores. On the north side the bird was formerly called "Pemblyco" or "Pimlico," probably from its call-note, while on the southern shores the name "Cahow" or "Cowhow" was applied to it. I found two nests in 1874, each containing a single young bird, one of which I kept alive for about six weeks, intending to send him to the Zoological Society's Gardens in London; but before I got an opportunity of doing so the unfortunate bird died. He had become remarkably tame, following me about the house and garden, waddling along awkwardly enough on his tarsi, and uttering a musical "chirrup" the while. He used to sit under the table where I was writing, pecking away at my boots, and apparently extremely happy. I fed him on fish, and gave him a salt-water tub occasionally, which he thoroughly enjoyed. He slept a great deal during the day, and usually got behind an open door—the darkest place he could find—for his "siesta." When I took him from the nest he was nearly able to fly, but still retained the long nestling-down of the young bird, slate-colored on the head and shoulders, light brown on the under parts; the former soon rubbed off, but the latter was more permanent, and was not got rid of for some days. The nests were simple holes in the face of the rock—my bird had barely room to turn round in his. There was no unpleasant smell about the nests or young birds, the peculiar, and to me not disagreeable, odor of the Shearwater tribe being alone distinguishable by its presence. I saw nothing of the old birds, who were in all probability far out at sea at the time. An egg of this species, kindly presented to me by Mr. Bartram, is, of course, pure white; it has a considerable polish, and is about the size of a bantam's, but less elongated in form. Mr. Bartram was good enough also to present me with two skins of the adult bird. He tells me that the statement made by the old historians of Bermuda as to the capture of the "Cahow" at night is no exaggeration; for on visiting an island one night where there were several pairs breeding, he quickly caught half a dozen of them, the stupid things settling on his body as he lay on the ground, and allowing themselves to be taken in his hand! I know of only one instance of a "Cahow" being seen on the wing in the day-time in Bermudian waters: this was in August, 1874, when one was shot crossing Castle Harbor, by Lieutenant Hopegood, Ninety-seventh Regiment; but I believe they are occasionally observed by fishermen on the south side.

With reference to the local names "Cahow" or "Cowhow," and "Pemblyco" or "Pimlico," Mr. Bartram writes to me on the 19th July, 1878: "About twelve months ago I came across an old book called 'A Complete System of Geography,' printed under the name of Herman Moll, &c., September 21, 1747, and the greater part of it professedly taken from a much older work called 'Britannick in America.' After describing Bermuda and its animal, insect, and vegetable productions, it gives the following account of the birds that were found on the islands at that time (say between 200 and 300 years ago): 'There was a great variety of fowl, both wild and tame, such as Hawks of all sorts, Storks, Herons, Bitterns, Ospreys, Cormorants, Bald-Coots, Moor-Hens, Swans, Teal, Snipes, Ducks, Widgeons, Sparrows, Woodpeckers, and a vast multitude and variety of the smaller kinds, besides Owls, Bats, and other nocturnal birds. Here was likewise formerly a kind of water-fowl, peculiar to those islands, which used to come to land and hatch its young in holes and burrows of the rock like rabbits. They were in great plenty, and were called Cow-koes. They were easily caught, and good to eat, the size of a Sea-mew. Our English made such havock among them they are become scarce. Here is likewise found the Tropic Bird and the "Pemlico." The last is seldom seen in the day-time, and, when it is, it is looked upon as the unwelcome harbinger of a storm.'

"Now my belief is that the Cow-koes of old are lost and gone long ago, and that the Cahow of the present day is neither more nor less than the old and ancient Pemlico. For, in the first place, the Cahow of this day is not nearly so big as a Sea-mew; secondly, the Pemlico has never been lost sight of by the Bermudians, the name having been handed down from father to son from the earliest times to the present day; and, thirdly, the habits of the old Pemlico and the Cahow of to-day correspond to a T—that is, they are seldom seen flying in the day-time, only at night."

Mr. Bartram goes on to say that on making inquiries of the people of Tucker's Town, St. David's, and Bailey's Bay, they knew nothing of the Cahow, but all could tell him of the Pemlico. From the above interesting account and from the strong evidence adduced by Mr. Bartram, I am inclined (with all due deference to Mr. Hurdis) to share his opinion as to the proper local name for *P. obscurus* being Pemblyco or Pemlico, and further to believe that the Cow-koes or Cahows of old were of a larger species, probably Manx Shearwaters (*P. anglorum*). This, after all, is pure conjecture and of doubtful interest to any but Bermudians themselves; still I venture to mention the facts in the hope that some more conclusive historical evidence may be forthcoming.

Puffinus opisthomelas (Coues): Black-vented Shearwater. On the 1st May, 1877, Mr. Bartram obtained a bird sitting on its egg on a rocky islet in Castle Harbor, which, from its measurements and admixture of black feathers with the white of the under tail-coverts, may be referable to the variety or species *P. opisthomelas;* though, as I know nothing of this bird and am ignorant of its synonymy, I have not thought it advisable to introduce it formally into my list. Moreover, to judge from Dr. O. Finsch's remarks on *P. obscurus* in his paper on the Birds of Ninafou Island, in the Pacific (P. Z. S., 1877, Part IV, pp. 786, 787), it would appear "that the black or white of the under tail-feathers forms no specific character, and even less so the more or less extent of the black along the rectal line."

Mr. Bartram informs me "The Black-vented Shearwater is 15 inches long; wing, 9; tail, 3⅛; bill, 1½ (not measuring along the curve); tarsus, 1¼; middle toe and claw, 1¾; under parts white; upper parts black; tail black; sides of the cheek below the eyes black; crissum white, but a black bunch of feathers on each side, lapping over and meeting across the vent; in other respects it is made like the Cahow, only larger; it does not exactly answer to Coues' description, but the black below the eyes is the distinguishing mark, and being a female may account for the difference. The egg is white and measures 2⅜ by 1½ inches."

To judge from the size of the bird and its egg, I should myself be inclined to consider this specimen a Manx Shearwater (*P. anglorum*), which has been already shown to breed in Bermuda by Mr. Bartram, but I have no means of deciding the question, and am compelled to leave it in its present unsatisfactory state.

Order PYGOPODES.

Family PODICIPIDÆ.

Genus PODICEPS, Lath.

184. ***Podiceps cornutus***, **Lath.** **Horned Grebe.**

Colymbus auritus, Linn.
Colymbus duplicatus, Müll.
Colymbus cornutus, Gm., Naum.
Podiceps cornutus, Lath., Temm., Boie, Steph., Keys. & Blas., Gray, Schl., Bp., Sw. & Reich., Nutt., Aud., Lawr., Coues, Finsch, Snow, and of authors generally.
Dytes cornutus, Kaup.
Colymbus obscurus, Gm.
Podiceps obscurus, Lath., Leach.
Colymbus caspicus, S. G. Gm., Gm.
Podiceps caspicus, Lath.
Colymbus nigricans, Scop.
Podiceps arcticus, Boie.
Podiceps solavus, Bp.

Length, 14; wing, 5.75; tarsus, 1.75; bill, .90.

Hab.—North America; Europe; Asia. (Coues.)

One shot by Dr. Cole, on the 24th of November, 1846, is now in the

Rev. H. B. Tristram's collection. One was killed by Captain Tolcher, Fifty-sixth Regiment, near Spanish Point, on the 1st February, 1855; it was in company with three or four others. Mr. Bartram has two specimens of different dates.

Genus PODILYMBUS, Less.

185. *Podilymbus podiceps*, (Linn.) Lawr. Pied-billed Grebe; Water-witch; Dabchick.

Colymbus podiceps, Linn., Gm.
Podilymbus podiceps, Lawr., Coop. & Suck., Coues, and of most late U. S. writers.
Sylbeocyclus podiceps, Bp.
Colymbus ludovicianus, Gm.
Podiceps ludovicianus, Lath.
Podiceps carolinensis, Lath., Bp., Sw. & Reich., Nutt., Aud., Gir., Max., and of writers generally.
Sylbeocyclus carolinensis, Bp.
Podilymbus lineatus, Heerm.

Length, about 13; wing, 5; tarsus, 1.50; bill, .75.

Hab.—North, Central, and part of South America; West Indies (Coues).

Three are recorded in "The Naturalist in Bermuda"—two obtained in October, 1849, and one by Major Wedderburn, in February, 1850. Mr. Hurdis once found a perfect skeleton of this bird by the side of a pond. Tolerably abundant in the winter of 1874–'75, especially at Trott's and Basden's Ponds. The way in which these birds can sink under water, without leaving a ripple behind, is truly marvellous, and entitles them fully to the name "Water Witch." They are very shy, but I once surprised one asleep on a flat stone, as much to my astonishment as to the bird's. All the specimens I saw were in immature plumage, wanting the black bar on the bill and the black throat-patch.

Family ALCIDÆ.

Genus MERGULUS, Ray.

186. *Mergulus alle*, (Linn.) Vieil. Little Auk; Sea-Dove; Dovekie.

Alca alle, Linn.
Mergulus alle, Vieil., Aud.
Uria alle, Temm., Bp., Aud.
Mergulus melanoleucus, Ray.
Alca candida, Brunn.
Alca alce, Gm.

Length, 7½; wing, 4½; tail, 1¼.

Hab.—Circumpolar portion of both the Western Palæarctic and Eastern Nearctic Regions, being driven southward to continental Europe and the coasts of the United States only by stress of weather; stragglers in some numbers as far south as the Canaries (Dresser).

Mr. Hurdis says: "One of these birds was captured alive on the 28th January, 1850, by a servant of the Rev. J. U. Campbell, at Ireland Island. It was in company with four or five others on a piece of grass-land near that gentleman's house. Unfortunately this specimen was destroyed by a pig before I had an opportunity of seeing it. My information was obtained from Mr. Campbell himself, who had this bird in his possession."

PART V.

ON A BIRD NEW TO BERMUDA,

WITH

NOTES UPON SEVERAL SPECIES OF RARE OR ACCIDENTAL OCCURRENCE.

BY

CLINTON HART MERRIAM, M. D.,
OF LOCUST GROVE, LEWIS COUNTY, NEW YORK.

ON A BIRD NEW TO THE BERMUDAS, WITH NOTES UPON SEVERAL SPECIES OF RARE OR ACCIDENTAL OCCURRENCE.

Melospiza fasciata (Gmelin) Scott. Song Sparrow.

Walter H. Merriam and myself found a dead Song Sparrow near Hungary Bay, Bermuda, April 18, 1881. This was after a heavy gale from the southwest, and the date would bring it about the close of the period of northward migration for this species along our coast. Although the weather was warm and the atmosphere laden with moisture the bird was perfectly fresh and could not have been dead long. It was doubtless lost at sea during the storm and carried exhausted to the Bermudas, where it perished from the effects of the tempest. This species has not heretofore been recorded from the Bermudas.

Pyranga rubra (Linn.) Vieillot Scarlet Tanager.

On the 18th of April, 1881, I found an adult male of this species, washed ashore on the south side of Bermuda, in Paget Parish.

Pelionetta perspicillata (Linn.) Kaup. Surf Duck.

During the middle and latter part of April, 1881, I on several occasions saw a male "Skunk-head Scoter," or "Surf Duck" swimming about in a shallow brackish-water pond in Devonshire Parish. The pond was bordered and encroached upon by a dense growth of the curious semi-aquatic mangrove (*Rhizophora mangle*), of which a single tree often covers several acres, and constitutes a miniature forest by itself. It was within this intricate and complex labyrinth of half-immersed roots and tangled branches that the duck was commonly found. Here he would drift about lazily but with considerable circumspection, obtaining an easy and varied sustenance from the multitudes of small "shell fish" and other marine animals that gather in countless hosts about the roots of this remarkable tree. Where could a duck find a more inviting or secure home than this secluded lagoon, hidden by a dense and almost impenetrable jungle of mangrove, and surrounded by a morass of treacherous bog?

Cymochorea leucorrhoa (Vieillot) Coues. Leach's Petrel.

While gathering shells along the stretch of south shore known as "Tuckerstown Beach," May 1, 1881, Mr. Wm. S. Peniston and I found an adult female of this Petrel lying dead upon the sand. The bird is common enough at sea a hundred or two miles from the Bermudas, but I never saw one near the islands.

PART VI.

THE REPTILES OF BERMUDA.

BY

SAMUEL GARMAN,
OF THE MUSEUM OF COMPARATIVE ZOOLOGY, CAMBRIDGE.

THE REPTILES OF BERMUDA.

SAURIA.—Lizards.

EUMECES LONGIROSTRIS Cope.

TESTUDINATA.—Turtles.

SPHARGIS CORIACEA Gray. Leather Back.
CHELONIA MYDAS Schw. Green.
THALASSOCHELYS CAOUANA Fitz. Loggerhead.
ERETMOCHELYS IMBRICATA Fitz. Hawksbill.

Five species of reptiles are all that are known to be found on the Bermudas. Only one of the five, *Eumeces longirostris*,* can be claimed by these islands as their own. This one is a long-bodied, short-limbed, red-faced little scinc, which loves the sunshine so brilliantly reflected in the bronzed tint of the smooth glossy scales, which has colors so subdued

---

*EUMECES LONGIROSTRIS.

Plestiodon longirostris Cope, 1861, Pr. Ac. Phil., 313.
Eumeces longirostris Cope, 1875, Check List, 45.
Eumeces longirostris Goode, Am. Jour. Sci. 1877, 290.

Body moderately stout, fusiform, depressed; head little larger than the neck, swollen at the angle of the mouth, tapering to the narrow muzzle; tail about one-sixth longer than the body, stout, conical, tapering to a point. Limbs short, rather stout; anterior reaching the fourth labial, posterior—without the toes—extending half way to the axilla. Digits compressed, with strong curved nails. Eye small; lower lid with large scales in front of the pupil which are translucent, if not transparent. Mouth-cleft medium, curved. Snout elongate, slightly swollen near the end in large specimens. Top of head somewhat flattened, with nineteen shields. Internasals in contact between anterior prefrontal and rostral. Prefrontals three, a pair in contact between frontal and anterior; latter broader than long, hexangular. Frontal hexangular, widening forward, obtuse angled in front. Supraoculars four on each side, anterior small, in contact with frontal and prefrontals. A pair of small quadrangular parietals, separating occipitals and frontal, in contact by their interior angles. Interoccipital elongate, narrow, wider and acute-angled forward. Posteriorly each occipital is joined by a large broad scale and laterally by an elongate temporal. Three plates between the angle of the eye and the nasal, anterior small. Rostral little broader than high, convex. Temporals 1—2, lower posterior large, semicircular margin forward, resting upon the hinder labial. Labials eight, anterior five lower, posterior three larger, sixth and seventh in contact with the small scales covering the eyelid, fourth and fifth in contact with a pair of small scales below the front angle of the eye. Mental large, broader than long, broader than rostral. Infralabials eight (8—9). A broad submental (1—2) immediately behind the mental. Behind these there are three nearly as broad, the front pair of which are in contact. Farther back there are one or two elongate narrow shields touching the infralabials. Scales and movements so rapid that the flash and rustle of disappearance are most often all that tell of its presence, and which, when caught napping by the sharp-sighted hunter, in favorite haunts in the wood among the rocks or about the buildings, frequently secures freedom by leaving its tail as a trophy in the hand of the enemy while retiring, but little the worse for the loss, to grow another. Its most common name is "Skink." This name is shared with many other species of the large family to which it belongs, a family which has representatives in nearly all the tropical and subtropical parts of the earth. In some of the West Indies allied species are called "Slippery Backs," in others "Mabouia," and in the United States "Blue tails" and "Scorpions."

Captain John Smith mentions the occurrence of lizards on the Bermudas previous to 1623, but in the same breath says they no longer existed at that date. "Lizards there were many and very large, but now none, and it is said they were destroyed by the Cat." There is a possibility that formerly some large species existed here, as at present upon Navassa (*Metapoceros*), or upon the Galapagos (*Conolophus* and *Amblyrhynchus*). Yet it is hardly probable that any lizards were entirely exterminated; it is more likely that the existing species, being without enemies and undisturbed, reached a greater size than is possible on the islands densely populated as they now are. One can have little idea of what the Captain had in mind when he used the word "large." If there had been very large lizards other writers would not have passed them without notice. Rev. Lewis Hughes, 1614, says nothing about them. Among his statements concerning the animals, after enumerating the birds, he says that "Here is no kind of beasts but hogges and cattes and they but in one or two places which are thought to come at first by

---

smooth, with two pores, hinder margin rounded, in thirty-six longitudinal rows, those of the flank irregularly ascending backward. Scales of middle of back and belly larger, those under the middle of the tail broadest. A small plate on each side of the pair of large ones in front of the vent.

Colors of young light brown on back, dark on flanks, lighter and bluish beneath. A dark-bordered white line along each edge of the back from the anterior supraciliary to the tail. A similar more or less broken line from below the eye across the ear to the hip. Between the white bands the flanks are dark brown. The dark color shades into the bluish at the sides of the abdomen. A narrow white band extends along the inner edges of the supraciliaries forward around the outer edges of prefrontals. Chin and throat yellowish red, cheeks more brown, and top of head reddish brown. Limbs and sides of belly and tail mottled with light. With age the white becomes more obsolete, the ground color a more uniform darker brown, and the yellowish red predominates on cheeks and crown. Specimens described furnished by Professor Goode, for whom they were collected by J. Mathew Jones, esq.

Very common on the Bermudas, frequenting the old walls and stone heaps in the cedar groves (Jones).

means of Shippe-wracke. The hogges were manie, but are now brought to a small number." Lizards do not appear in the list noted by William Strachy, 1610. "Worms I neuer saw any, nor any venomous thing, as Toade, or Snake, or any creeping beast hurtfull, onely some Spiders, which as many affirme are signes of great store of Gold." John Hardy's poetical description of the Bermudas, 1671, tells us that "No Adders, Serpents, Toads, or Snakes are seen to prejudice Man's health," but says nothing of lizards.

In recent times there have been several notices, one of which, that of Mr. Jones, in "The Naturalist in Bermuda," 1859, reports them to be very common. From the work of Dr. T. L. Godet, 1860, p. 251, the following is taken:

"In the class Reptilia (reptiles) we find the order *Chelonia* (the turtle tribe). This order is represented by the green turtle (*Chelonia mydas*, Holbrook); and the hawk's-bill (*Chelonia caretta*, Holbrook) is more or less brown or rufous. In the order *Sauria* we have the lizard tribe. The saurian reptiles are distinguished from the chelonian by the want of a shield and by the presence of teeth. The bluetailed skink (*Scincus fasciatus*, Holbrook) and the *Scincus ocellatus* (Da.) are representatives of this order. The *Scincus ocellatus* burrows in the sand so quickly that it is out of sight in an instant, and appears rather to have found a hole than made one. In the class Reptilia we have had occasion to name but a few genera and species; so barren are these islands in that class of animals which respire by lungs, having red and cold blood, and bodies covered with horny or cartilaginous plates or with hard scales."

Apparently the doctor supposed there were two species of Bermuda lizards, but of those he mentions, one, *fasciatus*, belongs to the Southern United States, and the other, *ocellatus*, to Australia, and neither is found on these islands. The species found here is evidently not a recent arrival. It differs so much from any of its neighbors in the new world that the question of its origin has become quite a puzzle. Scincs, Geccos, and other small reptiles of similar habits are sometimes carried immense distances in the ballast or cargoes of vessels. There would be no great difficulty in the way of introduction, but as yet we know of no species so closely allied as to suggest a common parentage among the more immediate ancestry.

The other four species making up the reptilian fauna of the Bermudas belong to the Sea Turtles, whose erratic habits and great capabilities as mariners have made them visitors upon all the shores of the temperate and torrid zones long enough before our race is said to have taken its first lessons of navigation in boats made of their gigantic shells. Of two of the four, Mr. Jones says that the Green, *Chelonia mydas*, is "the common turtle of the Bermudas," but "not abundant"; and the Hawkbill, *Eretmochelys imbricata*, is "not unfrequently taken."

The other two, the Leather Back, *Sphargis coriacea*, and the Loggerhead, *Thalassochelys caouana*, are only occasional visitors. They were first placed upon the list by Professor Goode, 1877. Below I have quoted from a number of accounts of the Bermudas and their life by the pens of those who wrote during the first half century of the existence of the colony. These quotations give a fair idea of the abundance, habits, and capture of turtles in those early days. Below them is placed all that could be gathered in the West Indies and among the Florida Keys, where the turtles are still numerous, but where, as was the case in the Bermudas, reckless destruction is gradually reducing their numbers.

The history of the Bermuda reptiles reaches back to a very early date in that of the islands themselves. December 17, 1593, the French vessel, commanded by de la Barbotière, was wrecked upon the Isle of Bermuda, and it was not until the 11th of the following May that the crew was able to get away, which they finally did in a vessel of their own make. Henry May, an Englishman who happened to be with the party, furnished an account of the adventure and the construction of the vessel, in which occurs the following:

"In stead of pitch we made lime, and mixed it with the oyl of tortoises, and as soone as the carpenters had calked, I and another, with ech of vs a small sticke in our hands, did plaister the mortar into the seames, and being in April, when it was warm and faire weather, we could no sooner lay it on, but it was dry, and as hard as a stone. In this moneth of April 1594, the weather being very hot, we were afrayd our water should fayle vs; and therefore made the more haste away; and at our departure we were constrayned to make two great chests, and calked them, and stowed them on ech side of our mainmaste, and so put in our prouision of raine water, and thirteen liue tortoises for our food, for our voyage which we intended to Newfoundland. In the South part of this Island of Bermuda there are hogs, but they are so leane that you cannot eat them, by reason the Island is so barren, but it yieldeth great store of fowle, fish and tortoises."

An anonymous writer, in an account of the loss of the ship of Sir

George Summers, July 28, 1609, among other things upon which his party subsisted, says: "Lastly they found the berries of Cedar, the Palmetto tree, the Prickle peare, sufficient fish, plentie of Tortoises and diuers other kinds which sufficed to sustaine nature." Sylvanus Jourdan's narrative of the same occurrence adds:

"There are also great store of Tortoises (which some call turtles), and those so great, that I have seene a bushell of egges in one of their bellies, which are sweeter than any Henne egge: and the Tortoise itselfe is all very good meate, and yieldeth great store of oyle, which is as sweete as any butter: and one of them will suffice fifty men a meale at least: and of these hath beene taken great store, with two boates at the least forty in one day. . . . We carried with vs also a good portion of Tortoise oyle, which either for frying or baking did vs very great pleasure, it being very sweete nourishing and wholesome."

William Strachy's account of this event is still more complete. It is strange he makes no mention of the lizards in his enumeration of the animals:

"Wormes I neuer saw any, nor any venomous thing, as Toade, or Snake, or any creeping beast hurtfull, onely some Spiders, which as many affirme are signes of great store of Gold. . . . And when there was any fret of weather (for vpon euery increase of wind the billow would be so great, as it was no putting out with our Gundall or Canow) that we could not fish nor take Tortoyses, then wee killed our Hoggs. But in February when the Palme Berries began to be scant or dry, and the Cedar berries failed two moneths sooner, true it is the Hogs grew poore, and being taken so, wee could not raise them to be better, for besides those Berries we had nothing wherewith to franke them: but euen then the Tortoyses came in againe, of which wee daily both turned vp great store, finding them on Land, as also sculling after them in our Boate strooke them with an Iron goad, and sod, baked, and roasted them. The Tortoyse is reasonable toothsom (some say) wholsome meate. I am sure our Company liked the meate of them verie well, and one Tortoyse would goe further amongst them then three Hogs. One Turtle (for so we called them) feasted well a dozen Messes, appointing sixe to euery Messe. It is such a kind of meat as a man can neither absolutely call Fish nor Flesh, keeping most what in the water, and feeding vpon Sea-grasse, like a Heifer, in the bottom of the Coues and Bayes, and laying their Egges (of which wee should finde fiue hundred at a time in the opening of a shee Turtle) in the Sand by the shoare side, and so couering them close leaue them to the hatching of the Sunne, like the *Manati* at Saint *Dominique*, which made the *Spanish* Friars (at their first arriuall) make some scruple to eate them on a Friday, because in colour and taste the flesh is like to morsells of Veale. Concerning the laying of their Egges, and hatching of their young *Peter Martyr* writeth thus in his Decades of the Ocean: At such time as the heate of Nature moueth them to generation, they come forth of the Sea, and making a deepe pit in the sand, they lay three or foure hundred Egges therein: when they haue thus emptied their bag of Conception, they put as much of the same againe into the Pit as may satisfie to couer their Egges, and so resorte againe vnto the Sea, nothing carefull of their succession. At the day appointed of Nature to the procreation of these creatures there creepeth out a multitude of Tortoyses, as it were Pismyers out of an anthill, and this only by the heate of the Sunne, without any helpe of their Parents: their Egges are as big as Geese Egges, and themselues growne to perfection, bigger than great round Targets."

The date of depositing the eggs is somewhat earlier than that given by the Florida Turtlers. Striking with an iron goad is a hint of what is now known as pegging. Speaking of the pinnace they built, he says: "Wee breamed her otherwise with Lime made of Wilkeshels and an hard white stone which we burned in a kiln, slaked with fresh water, and tempered with Tortoyses Oyle." In the commission of Governor Moore, 1612, he is requested to "be very carefull to make tryall of a mixture made with oyle of tortoises and powder of shells or such like, wch necessitye compeld our men to find ovt for there vse instead of pitch and tarr for trimminge there shipps, and did them excellent service for that purpose." One of this governor's companions, in a letter supplementing Silvanus Jourdan's account, gives the name "Turkles," a form which I find still to be in use in Eastern Massachusetts. "Turkles thare bee of a mightie bignesse: one Turkle will serue or suffice three or four score at a meale, especially if it be a shee Turkle, for she will haue as many Egges as will suffice fiftie or three-score at a meale; this I can assure you, for they are very good and wholesome meate, none of it bad, no, not so much as the very guts and maw of it, for they are exceeding fat, and make as good tripes as your beastes bellies in England. . . Also, we haue olives grow with vs, but no great store: many other good excellent things we haue grow with vs, which this short time will not permit me to write on so largely as I might:

but this is of truth that Hogges, Turkles, Fish and Fowle doe abound as dust of the earth."

That wanton destruction had decidedly lessened the number of turtles as early as 1620 is evident from the following act of the Assembly of that year:

"AN ACT AGAYNST THE KILLINGE OF OUER YOUNG TORTOYSES.

"In regard that much waste and abuse hath been offered and yet is by sundrye lewd and impvident psons inhabitinge wthin these Islands who in there continuall goinges out to sea for fish doe upon all occasions, And at all tymes as they can meete with them, snatch & catch up indifferentlye all kinds of Tortoyses both yonge & old little and greate and soe kill carrye awaye and devoure them to the much decay of the breed of so excellent a fishe the daylye skarringe of them from of our shores and the danger of an utter distroyinge and losse of them.

"It is therefore enacted by the Authoritie of this present Assembly That from hence forward noe manner of pson or psons of what degree or condition soeuer he be inhabitinge or remayninge at any time wthin these Islands shall p^{e}sume to kill or cause to be killed in any Bay Sound Harbor or any other place out to Sea: being wthin five leagues round about of those Islands any young Tortoyses that are or shall not be found to be Eighteen inches in the Breadth or Dyameter and that upon the penaltye for euerye such offence of the fforfeyture of fifteen pounds of Tobacco whereof the one half is to be bestowed in publique uses the other upon the Informer."

Allusions to the turtles become less frequent in the latter half of the century. In fact, it would seem as if the first twenty or thirty years of the settlement's existence had served so to reduce their numbers as to make them somewhat rare. This is the opinion of General Lefroy, to whose great work on the Bermudas I am indebted for the early history. In the preface of his work (Mem. Bermudas, Vol. I, preface, p. viii) he says: "The abundance of turtle, fish, and fowl rapidly came to an end." Other writers of recent times mention them as occurring in the waters off the shores, but do not speak of them as abundant. General Lefroy states in a foot-note (Vol. I, p. 67) that "The largest hawksbill turtle killed for many years past weighed 150 pounds; the largest green turtle 145 pounds in the shell." General Nelson, Geology of Bermuda, 1837, notes the occurrence of very large turtle bones in the sands near the shore. I give his statements at second hand, as found in Mr. Jones's book: "Turtle bones have also been dug up in the loose sand of the sea-beach, the turtles sharing the same fate as the bird before mentioned, being buried whilst depositing their eggs. Colonel Nelson was informed by an eye-witness that the dimensions of the skeletons of these animals were 9 feet in length by 7 in breadth." It is unfortunate that we do not know the species of turtle to which these bones belonged. There is room for difference of opinion in regard to the time of the turtle's interment. During storms bodies that have been thrown upon the beach by the waves are sometimes buried to considerable depths by the sand. A short time after the "epidemic" that was so fatal to the fishes on the western coast of Florida, in the fall of 1878, I saw the bodies of a number of large turtles, pr[illegible]bly killed by the same cause, floating along with the myriads of dead fishes in the edge of the Gulf Stream. A storm from a particular direction might have heaped up and buried that refuse of death upon the windward shore of some land, perhaps to be unearthed again by geologists of the future who would reckon the age of that stratum in millions of years.

The turtles of the Bermudas are of species more abundant in the West Indies and around the shores of the Caribbean and the Gulf of Mexico. Consequently I have not hesitated to gather in those localities, where it was more accessible, information concerning these creatures for use in an account of Bermuda reptiles. There is little doubt that turtles from the West Indies visit the Bermudas. The sea turtles are capable of enduring such an amount of hunger and fatigue, and are possessed of such powerful muscular organization, that, aided by the tides and currents, they perform journeys of almost incredible length. It is not a very rare occurrence that they are met with in mid-ocean. Those taken on the coasts of England are supposed to have crossed the Atlantic with the help of the Gulf Stream. Some herpetologists think it likely that turtles cross the Atlantic and enter the Mediterranean. The Leatherback and Loggerhead are the most erratic. Though their proper home may be said to extend not more than 35° on each side of the equator, they are found straggling as many as 15° farther to the north or south. If specimens enter the Atlantic from the other oceans it is most likely to be by way of the Cape of Good Hope, where the currents would seem to favor the passage. However, there is only one case in which there is any doubt, that of *Sphargis*, of which specimens from the different oceans are so much alike that writers are still undecided whether there is more than one species. Certain respects in which the Pacific "Trunkbacks" differ from those of the Atlantic have induced me to separate them, distinguishing the former by the name *Sphargis schlegelii*, and the latter by that by which it is commonly known, *Sphargis coriacea*.

The Green Turtle, *Chelonia*, and the Hawkbill, *Eretmochelys*, seldom venture more than 35° from the equator. Species of these genera are unlike in the Atlantic and Pacific. Those of *Chelonia* are most numerous and seem to vary most according to locality, which would suggest a disposition less erratic or perhaps a distribution determined to some extent by that of the grass of their favorite pastures. On our coasts these turtles range from the Carolinas to Southern Brazil, and from Southern California to Peru. The places of greatest abundance are on the shoals in the vicinage of low sandy beaches or islands not occupied by men. Persons who make a business of collecting turtles and eggs in the Florida Keys and among the West Indies claim that the great demand has resulted in no diminution of the numbers. In the Bermudas, as we have seen, those well able to decide are satisfied that turtles are growing less numerous.

For much of the information given below I am indebted to my friend Richard M. Kemp, of Florida, who has taken great pains to secure answers to the lists of questions sent out; the balance was gathered upon the grounds by observation or from the turtlers. His notes included items concerning the "Bastard," a turtle intermediate between the Loggerhead and Green, of which he was fortunate enough to secure a pair of fine specimens and which have been elsewhere described under the name *Colpochelys Kempii*. Young turtles of the five kinds are eaten. Green turtles are most sought. Old ones of the other kinds are not so palatable. Bastards and Trunkbacks are least cared for. All kinds are found in the same region during the entire year. "They eat seaweed, crawfish, conchs, fish, a kind of sponge called Loggerhead sponge, and the Portuguese men-of-war." The latter, *Physalia*, are quite plentiful in the winter, and turtles of all kinds are very fond of them and are easily taken while eating. They shut their eyes to avoid the stings of the men-of-war, constantly using the flippers to brush them away and can at such times be approached and taken into a boat without pegging. On the turtle grounds there were numbers of specimens of a large marine sponge, sometimes as much as 3 feet in diameter, and with very little silicious framework, from which portions had been torn. These were said to be Loggerhead sponges from which turtles had been eating. A larger proportion of the food of the Green Turtles is vegetable. When in the crawls or turtle pens they are fed upon fishes and meats of various kinds, as are the other sorts. The principal food of the genus (*Chelonia*) seems to be the sea-grass, *Zostera marina*, commonly called "Turtle Grass." When grazing turtles eat the roots, and the tops of the grass rising to the surface mark the feeding ground and often betray them to the "turtler." My informant tells me the Loggerheads nip the smaller portion of the spiral from the large conchs, and in this way extract the animal. Trunkbacks sometimes exceed 1,200 pounds in weight. The largest we have been able to measure was close upon 7 feet in length and weighed about 1,000 pounds. The Green are next in size. Eight hundred and fifty pounds is the largest of which we can learn. [illegible] largest Loggerhead of which we have positive information did not exceed 450; and Mr. Kemp says a shell turtle weighing 160 pounds is a very large one.

Near the haunts prices of the meats vary from 4 to 10 cents per pound alive, and from 12 to 18 dressed. A specimen of Green Turtle weighing 100 pounds is considered to be between three and four years of age. In its first year it would attain a weight of 15 to 20 pounds. Turtles are captured by pegging, by means of long nets, and when they come on shore to lay. Ordinarily the creatures are timid and endeavor to escape. In the water it is not very difficult to follow them, as they rise from time to time to breathe. When tired out they go to the bottom, and seldom make much resistance to being hauled on board the boat or towed ashore by a line attached to the peg. A peg is a small steel instrument like a blunt nail, to which a long cord is attached, and which slips out of the socket in which it is placed, on the end of a long pole, on being struck into the shell of the turtle. Being firmly wedged by the bone, the peg enables the turtler to draw his prey about by the line attached to it. By much practice the turtlers become very dexterous in taking objects in the water. One who assisted me in collecting, and to whom I am indebted for a great deal of information, Daniel Williams, of Florida Keys, did not seem to have his aim at all affected by differences of depths or angles in situations in which a novice would find it difficult to strike objects of five times the size. During the mating season turtles are much less timid, and boats are allowed to approach quite near. The season varies somewhat for the different kinds. From the most reliable accounts it is April to June for the Green, Loggerhead, and Shell turtles (Hawkbill), and for Bastard and Trunkback it is December to February (see below). Coupling takes place in the water and continues for considerable lengths of time. A strong nail on the first digit of the forward paddles is bent downward so as to form a hook, with which the shell of the female is grasped. "From two to four, sometimes five, lots of eggs, from 75 to 200 each, are laid in a season." The layings are fourteen to fifteen days apart—"never more than fifteen nor less than fourteen; so we know just when to expect her again, and always very near the place where she laid the first lot."

The nests are made at night. About to lay, the turtle approaches the shore cautiously; if not disturbed she lands and at once proceeds to select a place to dig. The excavation is a foot or more in depth. After the sand has been scooped out by the paddles and the eggs laid, the sand is replaced carefully and packed by the weight of the body during replacement. The trail from the water to the nest resembles the track of a stone-sled and leads to a space larger than the turtle which has been much trampled over. Somewhere in this space the turtler expects to find the eggs. He uses a small stick with which he probes the trodden area in all parts until, plunged through one or more of the eggs, the yelk upon the probe locates them. A story is told by the hunters to the effect that after the nest is finished the turtle goes along the beach a little way to trample over another space, in which no eggs are placed, before returning to the water. On the fourteenth or fifteenth night she is expected to return and make another nest near the first. The hunter waits for her, and after she has left the water turns her on her back. She is unable to right herself when turned, and her captor returns at his leisure to take her to market. The eggs hatch in six to eight weeks, and the young scramble into the water at once. They have no means of defense, and are eagerly preyed upon by various birds and fishes on their way and after they reach the sea. In the stomach of a shark, which the kindness of Lieut. S. M. Ackley, U. S. N., enabled me to examine, a 10-pound Green Turtle was found. The shell was too hard for the shark's teeth, and was scored all over by the efforts of the "man-eater" to divide it. Discouraged in his attempts he had at last swallowed it entire. The greatest destruction undoubtedly takes place during the first month or two of existence, while the shell is comparatively soft and the size such as places the little creatures at the mercy of the fowls and most of the common fishes.

It will be seen that the Florida authorities place the egg-laying time in April, May, and June; in this they agree with the majority. The notice cited above from William Strachy's narrative apparently places it earlier, but it does not fix an exact date for the arrival of the turtles on the shore. In regard to *Sphargis*, however, I find something more conflicting, and, it being so definite as to dates, locality, &c., am inclined to believe it entitled to consideration. The item is copied from the Morning Journal of April 30, 1846, by Gosse in "The Naturalist's Sojourn in Jamaica," 1859, p. 306, and bears the marks of its origin in evidence of desire to make the most of it, yet, as Mr. Gosse suggests, it has sufficient appearance of accuracy to warrant preservation. The locality of the occurrence is Negril Bay, at the west end of Jamaica:

"The anxiety of the fishermen in this little village was aroused on the 30th of last month by the track of a huge Sea-monster, called a Trunk-turtle, which came on the sea-beach for the purpose of laying her eggs. A search was made, when a hole in the sand was discovered, about 4 feet in depth, and as wide as the mouth of a half-barrel, whence five or six dozen white eggs were taken out. The eggs were of different sizes, the largest the size of a duck's egg. On the morning of the 10th of this month, at half-past five o'clock, she was discovered by Mr. Crow on the beach, near the spot where she first came up. He gave the alarm, when all the neighbors assembled and got her turned on her back. She took twelve men to haul her about 200 yards. I went and measured her, and found her dimensions as follows: From head to tail, 6 feet 6 inches; from the outer part of her fore fin to the other end (to the tip of the other?), 9 feet 2 inches; the circumference round her back and chest, 7 feet 9 inches; circumference of her neck, 3 feet 3 inches; the widest part of her fore fins, 18 inches; her hind fins, 2 feet 4 inches in length. Her back is formed like a round top of a trunk, with small white bumps in straight lines, resembling the nails on a trunk; her color is variegated like the rainbow (probably the living skin displayed opaline reflections); there is no shell on her back, but a thick skin, like pump leather."

The date given would place the time of laying in the latter part of March instead of as early as claimed by the fishermen and turtlers, December, January, and February, for this genus. *Sphargis* is the most rare and least known of the sea turtles.

In early times turtles were so numerous around the Bermudas that two boats were able to take forty in a day; now they are so rare that this number more nearly represents what are taken in a season. To any one who takes the trouble to look into the matter the fact is patent enough that unless their enemies are restrained these animals are des-come as rare in the waters of Florida and the West Indies ow about the Bermudas. It would seem as if, with proper w, a creature which lays such a large number of eggs idly might be propagated and multiplied to almost s growing their favorite food. We know of nothing eir pastures are so available. What locality is better n the Bermudas for a grand experiment in turtle culture? atch and take care of themselves if let alone. Any move- that will protect them in the coupling and laying season and in early days, or that will reduce the number of their destroyers, end to increase and cheapen the supply. Possibly eggs might be ted and hatched, the young guarded for a while, and set free the days of greatest mortality had passed and they had grown rge and hard for the birds and smaller fishes. Eggs could be ted. Perhaps some action has already been taken in regard to atter in the Bermudas and in the United States; if not, the ques- s respectfully suggested to the authorities as one worthy their at- n.

OF THE SEA TURTLES (CHELONIOIDÆ), WITH SYNONYMY.

ERETMOCHELYS IMBRICATA. Hawkbill. Caret.

Tropical Atlantic.

Chelonia (Eretmochelys) imbricata Fitz., 1843, Syst. Rept., 30.

Eretmochelys imbricata Agassiz, 1857, Contr. i, 381; Goode, 1877, Am. Jour. Sci., xvi, 290.

Testudo imbricata Linn., 1758 Syst. Ed. x, I, 197; 1766, Syst. Nat., Ed. xii, 350; Walb., 1782, Chelon., 46, 110; Schneid., 1783, Schildkr., 309,—1786, Mag. Z. Nat., 258; Gmelin, 1788, Linn. Syst. Nat., i, 1036; Donnd., 1798, Zool. Beitr., 3, p. 3; Schoepff, 1792, Hist. Test., 83, pl. 18 A and B; Latr., 1801, Hist. Rept., i, p. 50; Shaw, 1802, Gen. Zool., iii, 89, pl. 26 and 27; Daudin, 1805, Hist. Rept., v, p. 39.

Chelonia imbricata Schweigg., 1814, Prodr. Monogr. Chelon., 21; Gravenh., 1829, Del. Mus. Vrat., I, 6; Wagl., 1830, Syst. Amph., 133; Gray, 1831, Cataphracta, p. 52; Gray, 1831, Syn. Rept., Griff. An. King., ix, p. 21; Dum. Bibr., 1835, Erp. Gen., v, 547, pl. 23, f. 2; Bell, 1839, Brit. Rept., pp. 1 and 10; Holbr., 1842, N. A. Herp., ii, 39, pl. v; Coct. & Bibr., 1843, Rept. Cuba, 96; Bell, 1849, Brit. Rept., pp. 1 and 11, fig.; Dum., 1851, Cat. Meth., 25: Strauch, 1862, Chelon. Stud., 181; Sowerby & Lear, 1872, Tortoises, pl. 57 and 58; Temm. & Schl. 1838, Fauna Jap., Rept., p. 13. pl. V. f. 1, 2.

Caretta imbricata Merr., 1820, Syst. Amph., 19; Max., 1825, Beitr. Nat. Brazil, i, 24; Fitz., 1826, Neue Class. Rept., 44; Bonap., 1836, Chelon. Anal., 9; Gray, 1844, Cat. Tort., 54; Gray, 1855, Cat. Sh. Rept., 74 (part); Gray, 1870, Suppl. Cat. Sh. Rept., 119; Gray, 1873, Pr. Zool. Soc., 397; Gray, 1873, Hand list, 92; Girard, 1858, U. S. Expl. Exp. Rept., p. 440.

Onychochelys kraussii Gray, 1873, Pr. Zool. Soc., 398; Gray, 1873, Hand list, p. 93.

Chelonia virgata Wagl., 1833, Icon et Descr. Amph., pl. 29.

Chelonia multiscutata Kuhl, 1820, Beitr., 78.

References under various names: Rochefort, 1658, Hist. Ant., 231; DuTertre, 1667, Hist. Gen. Ant., ii, 229; Grew, 1681, Mus. Reg., 38, pl. 3, f. 4; Labat, 1724, Voy. Amer., i, pp. 182, 308; Sloane, 1725, Jamaica, ii, 331; Seba, 1734, Thesaur, i, 79, f. 4; Catesby, 1743, Carol., ii, 39; Brown, 1756, Jamaica, 465; Knorr., 1767, Delic. Nat, ii, p. 124, pl. 30; Daub. Dict Encycl, 1784-'92; Parra, 1787, Descr., &c., 112, pl. 42; LaC., 1788, Quad. Ovip., i, p. 105, pl. ii; Donnd., 1798, Zool. Beitr., iii, 3; Shaw, 1802, Gen. Zool., iii, 89, tab. 26 and 27; Bosc, Nouv. Dict., 1816-'19, vol. 34, 257; Cuv., 1817, Régn. Anim., 13; Kuhl., 1820, Beitr., 78; Lesson, 1834, Belang. Voy., 302; Bonnat., 1789, Erpét., 21; Ray, 1693, Synops., 260.

ERETMOCHELYS SQUAMATA. Hawkbill.

Hab. Tropical Pacific and Indian Oceans.

Eretmochelys squamata Agassiz, 1857, Contr., i, 385.

? *Caretta bissa* Rüpp., 1835, Neue Wirb. Abyssin., 4, taf. 2.

Chelonia imbricata Blyth, 1846, Jour. As. Soc., 376; Tschudi, 1845, Fauna. Peru, Rept., 22.

Caretta imbricata Kelaart, 1852, Rept. Ceylon, i, 180.

Caretta squamata Krefft, 1871, Austral. Vertbr., 39; Theobold, 1876, Rept. Ind., 33.

Caretta Squamosa Girard, 1858, U. S. Expl. Exp. Rept., 442.

Caretta rostrata Grd., 1858, Expl. Exp. Rept., 446, pl. xxx, f. 8-13.

Testudo imbricata Penn., 1769, Ind. Zool., 87.

Le Caret Ferm., 1765, Hist. Holl. Équinox., 50.

THALASSOCHELYS CAOUANA. Loggerhead. Caouane.

Hab.—Tropical Atlantic.

Thalassochelys caouana Fitz., 1841, Zool. Ann. Wien Mus., i, 128,—1843, Syst. Rept., 30; Agassiz, 1857, Contr., i, 384; Goode, 1877, Am. Jour., 290.

Testudo caretta, Linn., 1758, Syst., Nat. 197; Linn., 1766, Syst., Nat. 351; Walb., 1782, Chelon., 4, 95; Gmel., 1788, Syst. Linn., 1038; Schœpff, 1792, Hist. Test., pp. 67, 74, pl. 16, 17, f. 3; Donnd., 1798, Zool. Beitr. iii, 9; Latr., 1801, Hist. Rept., i, p. 33; Shaw, 1802, Gen. Zool., iii, 85, pl. 23, 24, 25; Cuv., 1829, R. An., ii, 14; Griff., Pidg., 1831, An. King., ix, 20.

Caretta caouana Fitz., 1826, Neue Class. Rept., 44.

Chelonia caretta Gravenh., 1829, Del. Mus. Vrat., I, 7.

Caouana caretta Gray, 1844, Cat. Tort., 52; Gray, 1855, Cat. Sh. Rept., 73; Gray, 1870, Suppl. Cat. Sh. Rept., 118; Gray, 1873, Pr. Zool. Soc., 404; Gray, 1873, Hand-list, 89.

Chelonia caouana Schweigg, 1814, Prodr. Monogr. Chelon., 22; Risso, 1826, Eur. Merid., iii, 85; Wagl., 1830, Syst. Amph., 133, Tab. i, f. 1-23; Gray, 1831, Syn., 53; Bibr., 1832, Exp. Morée, Zool. 64; Dum. Bibr., 1835, Erp. Gen., ii, p. 552; Dum., 1851, Cat. Meth., 25.

Testudo caouana Bonnat., 1789, Érpet., 20; Daud., 1805, Rept., ii, p. 54, pl. 16, f. 2; Cuv., 1817, R. An., ii, 13.

Testudo cephalo Schneid., 1783, Schildkr., 303.

Caretta cephalo Merr., 1820, Amph., 18; Max., 1825, Beitr., i, 25: Risso, 1826, Eur. Merid, iii, 85.

Chelonia (*caretta*) *cephalo* Less., 1834, Voy. Belang., 300.

Chelonia (*caouana*) *cephalo* Coct. & Bibr., 1843, Rept. Cuba, 35.

Chelonia cephalo Temm. & Schleg., 1838, Faun. Jap., 23, f. 1, 2, 3, pl. 4.

Chelonia pelasgorum Val., 1840, Rept. Morea, tab. 10.

Cephalochelys oceanica Gray, 1873, Pr. Zool. Soc., 408; Hand-list, 91.

Caouana elongata Gray, 1855, Cat. Sh. Rept., 73; Suppl., 1870, p. 118.

Eremonia elongata Gray, 1873, Pr. Zool. Soc., 403; Hand-list, 96.

Thalassochelys corticata Grd., 1858, Expl. Exp. Rept., 431; Strauch, 1862, Chelon. Stud., 187.

UNDER VARIOUS NAMES: Rondelet, 1554, Pisc. Libr., xvi, 445; Gesner, Aquat. Libr., 3, 1131; Gesner, 1554, Hist. Anim. Quad. Ovip., 114; Gesner, 1629, Hist. Anim., iv, 944; Aldrov. 1621, Quad. Ovip., 712; Rochefort, 1658, Hist. Ant., 231; Olear. Mus., 1666, 27; Dutertre, 1667, Hist. Ant., ii, 228; Ray, 1692, Synops. An., 257; Labat, 1724, Voy. Amer., i, pp. 182, 311; Seba, 1734, Thesaur., i, pl. 79, f. 6; Catesby, 1743, Carol., ii, 40; Brown, 1756, Jamaica, 465; Gronow, 1763, Zooph., p. 16, No. 71; Gottw., 1781, Phys. Anat. Schildkr; Parra, 1787, Descr., etc., 112, pl. 43; La C., 1788, Quad. Ovip., i, 95; Bechst. 1800, Ueb. La C., i, 110; Meyer, Zeitr.-Vertr., i, pl. 30, 31; Brown, 1776, Ill. Zool., 116, pl. 48; Mus., Besl., pl. 60; Edwards, Birds t, 206; Bosc, Nouv. Dict., vol. 34, p. 256, 1816–'19; Cuv., 1817, Regn. Anim., 14.

THALASSOCHELYS OLIVACEA. Loggerhead.

Hab.—Tropical Pacific and Indian Oceans.

Chelonia olivacea Eschsch., 1829, Zool. Atl., Tab. 3, Descr., p. 2 (20); Cantor, 1847, Cat. Malay. Rept., 13.

Thalassochelys (*Lepidochelys*) *olivacea* Fitz., 1843, Syst. Rept., 30.

Thalassochelys olivacea Fitz., 1841, Zool. Ann. Wein Mus., i, 128; Agassiz, 1857, Contr., i, 385.

Chelonia dussumierii Dum. Bibr., 1835, Erp. Gen., ii, 557; Dum., 1851, Cat. Meth., 25.

Caouana dussumierii Smith, 1849, Zool. S. Africa, App., p. 2.

Chelonia caretta var. *β*, Gray, 1831; Cataphracta, 54.

Caouana olivacea Gray, 1844, Cat. Tort., 53; Gray, 1855, Cat. Sh. Rept., p. 73; Gray, 1870, Suppl. Cat. Sh. Rept., 118; Theobald, 1868, Jour. Linn. Soc., x, p. 20; Krefft, 1871, Austral. Vetebr., 39; Theobald, 1876, Rept. Ind., 32.

Lepidochelys olivacea Grd., 1858, Wilkes Exp. Rept., 435; Gray, 1873, Pr. Zool. Soc., 407; Gray, 1873, Hand-list, 91.

Caretta olivacea Rüpp., 1835, Neue Wirbelth. Abyssin., 7, pl. 3.

Testudo japonica Thunb., 1787, Vet. Akad, viii, 178, pl. vii; Schn., Gesellsch Nat. Fr. Berl., x, 266.

Caretta thunbergii Merr., 1820, Syst., 19.

Lepidochelys dussumierii Grd., 1858, Expl. Exp., 437.

THALASSOCHELYS (COLPOCHELYS) KEMPII.

Kemp's Gulf Turtle. "Bastard."

Hab.—Northeastern part of the Gulf of Mexico.

Thalassochelys Kempii Garman, 1880, Bull. Mus. Comp. Zool., 123.

CHELONIA MYDAS. Green Turtle.

Hab.—Tropical Atlantic and adjacent waters.

Testudo mydas, var. *γ* Linn., 1758, Syst. Nat., 197; Linn., 1766, Syst. Nat., 351; Gmel., 1788, Linn., Syst. Nat., i, 1037.

Testudo myd , Schœpff, 1792, Hist. Test., 73, pl. 17, f. 2; Bonnat., 1789, Erpét., 19; Cuv., 1798, Tabl. Élém. 288,-1817, R. An., ii, 13,-1829, R. An. ii, 13; Oppel, 1811, Prodr., 9; Latr., 1801, Rept., i, 22, pl. 1, fig. 2; Daud., 1805, Rept., v, 10, pl. 10, f. 2; Griff. & Pidg., 1831, An. King., ix, 81.

Chelonia mydas, Schweigg., 1814, Prodr. Monogr. Chelon., pp. 10 & 22; Gray, 1825, Ann. Phil., x, 212,-1831, Synops. in Griff. An. King., ix, p. 20; Gray, 1831, Cataphracta, 52; Lesson, 1834, Belang. Voy., 299; Dum. Bibr., 1835, ii, p. 558; Holbrook, 1842, N. A. Herp., ii, 25, pl. 2; Cocteau & Bibron, 1843, Rept. Cuba, 19; Dum., 1851, Cat. Meth. Rept., 24; Agassiz, 1857, Contr., i, 378; Sowerby & Lear, 1872, Tortoises, 13, pl. 59 & 60; Gravenh., 1829, Del. Mus. Vrat., i, 5; Wagl., 1830, Syst. 133.

Caretta mydas Fitz., 1826, Neue Class. Rept., 44.

Testudo viridis Schn., 1783, Schildkr., 309, Tab. ii; Latr., 1802, Rept., i, 48.

Chelonia viridis Temm. & Schl., 1838, Faun. Jap., 18; Gray, 1844, Cat. Tort., 54; Gray, 1855, Cat. Sh. Rept., 75; Strauch, 1862, Chelon. Stud., 185; Gray, 1870, Suppl. Cat. Sh. Rept., 119; 873, Pr. Zool. Soc., 402; Gray, 1873, Hand-list, 95; Girard, 1858, Expl. Rept., 453.

Chelonia virgata Coct. & Bibr., 1843, Cuba, 26 (part).

References under various name utertre, 1667, Hist. Ant., ii, 227; Sloane, 1725, Jamaica, ii, 331; Roch , 1658, Hist. Ant., 228; Seba, 1734, Thesaur., i, pl. 79, f. 5; Catesby, 1743, Carol., ii, 38; Brown, 1756, Jamaica, 465; Gronow, 1764, Mus. Ichth., ii, 85, No. 68; Parra, 1787, Descr., etc., 112, tab. 41; La C., 1788, Quad. Ovip., i, 54, fol. 1, p. 92; Shaw, 1802. Gen. Zool., iii, 80, pl. 22; Lesson, 1843, Belang. Voy., 298, 299, 301, 302; Cuv., 1829, Regn. Anim., ii, 13; Audubon, Ornith. Biog., ii, 374; Bonnat. Encyl. meth., pl. 3, f. 2; Bosc. Nouv. Dict., 1816–19, p. 252, tome 34; Merr., 1820, p 18; Wiegm. u. Ruthe, 1832, Handb. Zool., 164; Tschudi, 1845, Fauna Peru., 22.

Var. *Marmorata.*

Hab.—Atlantic, Ascension Island.

Chelonia marmorata **Dum. Bibr., 1835, Erp. Gen., ii, 546; Dum., 1851, Cat. Meth., 24; Girard, 1858, Expl. Exp. Rept., 455 Strauch, 1862, Chelon. Stud., 187.**

CHELONIA VIRGATA. Green Turtle.

Hab.—Tropical portions of Western Pacific and Indian Oceans.

Chelonia virgata Schweigg., 1814, Prodr. Monogr. Chelon. 21; Guerin, 1829–'38, Icon. Règn. Anim., pl. 1, f. 4; Dum. Bibr., 1835, Erp. Gen., ii, 541; Coct. & Bibr., 1843, Rept. Cuba (part); Blyth, 1846, Jour. As. Soc., 376; Cantor, 1847, Cat. Rept. Malay, 13; Gray, 1844, Cat. Tort., 54; Dum., 1851, Cat. Meth., 24; Gray, 1855, Cat. Sh. Rept., 74 (part); Agassiz, 1857, Contr., i, 379; Strauch, 1862, Chelon. Stud., 183; Swinhoe, 1863, Ann. Mag., 221; Theobald, 1868, Jour. Linn. Soc., x, 20; Gray, 1870, Suppl. Cat., Sh. Rept., 119; Krefft, 1871, Austral. Vert., 39; Gray, 1873, Pr. Zool. Soc. 402; Gray, 1873, Hand-list, 93; Theobald, 1876, Rept. Ind., 33; Girard, 1858, Expl. Exp. Rept., 437.

Chelonia mydas var. Gray, 1831, Cataphracta, 52, 53.

? *Chelonia maculosa* Cuv., 1820, Règn. Anim., 13; Dum. Bibr., 1835, Erp. Gen., ii, 544; Dum., 1851, Cat. Meth., 24; Girard, 1858, Expl. Exp., Rept., 454.

Chelonia lachrymata Cuv., 1829, Règn. Anim., ii, 13.

Caretta or *Sea Tortoise* Bruce, 1778, Voy. Nile, v, pl. 42.

? *Chelonia formosa* Girard, 1858, Expl. Exp., Rept., 456, pl. xxxi, f. 1–4.

? *Chelonia tenuis* Grd., 1858, Expl. Exp., Rept., 461.

? *Testudo macropus* Walb., 1782, Chelonogr., 112.

? *Euchelys macropus* Girard, 1858, Expl. Exp., Rept., 448, f. 9–11.

CHELONIA AGASSIZII.

Hab.—Tropical portion of Eastern Pacific.

Chelonia virgata Agassiz, 1857, Contr., i, 379.

Chelonia agassizii Dum. Boc., 1870, Exp. Sci. Mex., pt. 3, pl. 6, p. 26; Garman, 1880, Bull. Mus. Comp. Zool., 126.

CHELONIA DEPRESSA.

Hab.—Australian seas.

Chelonia depressa Garman, 1880, Bull. Mus. Comp. Zool., 124.

SPHARGIDIDÆ.

SPHARGIS CORIACEA. Trunk or Leather Turtle.

Hab.—Tropical and temperate portions of the Atlantic.

Testudo coriacea s. mercurii Rond., 1554, Pisc. libr., xvi, 450; Gesner, 1620, Hist. Anim., iv, 496.

Testudo coriacea Linn., 1766, Syst. Nat., 350; Schneid., 1783, Schildkr., 312; Vandell. ad Linn. Patav., 1761, fig.; Schœpff, 1792, Hist. Test., 123 to 128; Latr., 1801, Rept., i, 58, pl. 3, f. 1; Daud., 1805, Rept., ii, 62, pl. 18, f. 1; Turton, Brit. Fauna, 78; Griff. & Pidg., 1831, An. King., ix, 93.

Sphargis mercurialis Merr., 1820, Amph. 19; Risso, 1826, Eur. Merid., iii, 85; Max., 1825, Beitr. Natg. Brazil, i, 26; Gray, 1869, Pr. Zool. Soc., 224.

Chelonia coriacea Schweigg., 1814, Prodr. Monogr. Chelon., pp. 10, 20.

Chelonia (Sphargis) coriacea Gray, 1831, Synops. in Griff. An. King., ix, 20.

Sphargis coriacea Gray, 1831, Cataphracta 51; Dum. Bibr., 1835, Erp. Gen., ii, 560; Bell, 1839, Brit. Rept., 11; Holbr., 1842, N. A. Herp., ii, p. 45, pl. vi; Gray, 1844, Cat. Tort., 51; Bell, 1849, Brit. Rept., 12; Gosse, 1851, Jamaica, 306; Gray, 1855, Cat. Sh. Rept., 71; Agassiz, 1857, Contr., i, 373; Gray, 1864, Pr. Zool. Soc.; Gray, 1870, Suppl. Cat. Sh. Rept., 119, f. 40.; Gray, 1873, Pr. Zool. Soc., 411; Gray, 1873, Hand-list, 96; Goode, 1877, Am. Jour., xiv, 290; Bonap., Fauna Ital.; Jenyns, Brit. Vert., 290; Gervais, Nouv. Arch. Mus., viii, pp. 199–228, pl. 5–9.

Testudo tuberculata Gravenh., 1829, Rept. Mus. Vrat., 9.

Dermochelys atlantica (Les.) Cuv., 1836, Règn. Anim., i, 367; Cuv., 1829, Règn. Anim.

Dermatochelys porcata Wagl., 1830, Syst. Amph., 133, atl., pl. i, f. 1–23, ix, f. 10; Fitz., 1843, Syst. Rept., 30.

Coriudo coriacea Flem., Brit. Anim., 149; Harl., 1827, Amer. Herp., 83; Harl., 1827, Jour. Ac. N. Sc. Phil., v, 399.

REFERENCES UNDER VARIOUS NAMES: Delafont, 1729, Mem. Acad., 8; Borlase Cornwall, 287, pl. 27; Catesby, 1743, Carol., ii, 40; Bodd., 1761, Gaz. Santé, No 6; Fougeroux, 1765, Hist. Acad. Sci., 44; Daub. Encycl. Meth., 1784–'92; Penn., Brit. Zool., iii, 7; Amoreux, Jour. Phys., 1778, p. 65; La C., 1788, Quad. Ovip., i, 111, pl, 5; Bonn., 1789, Encycl. Meth., pl. 4, f. 2; Donnd., 1798, Zool. Beitr., iii, f. 2; Bechst., 1800, Ueb, La C. Quad. Ovip., 135; Bosc, 1816–'19, Nouv. Dict., vol. 34, 257; Cuv., Règn. Anim., ii, 14.

Var. *Schlegelii.*

Hab.—Tropical Pacific and Indian Oceans.

Sphargis coriacea Bleeker, 1857, Nat. Tijds. Ned. Ind., 471.

Dermatochelys coriacea Theobald, 1868, Jour. Linn. Soc., x, 20; Theobald, 1876, Rept. Ind., 34; Swinhoe, 1870, Pr. Zool. Soc., 409; Krefft, 1871, Austral. Vertebr., 39.

Sphargis mercurialis Temm. & Schl., 1838, Faun. Jap., Chelon, pl. 1–3; ? Smith, 1849, Zool. S. Africa, App., p. 2.

PART VII.

ANNELIDA FROM BERMUDA,

COLLECTED BY G. BROWN GOODE.

BY

Professor H. E. WEBSTER,
OF UNION COLLEGE, SCHENECTADY, N. Y.

ANNELIDA FROM BERMUDA.

Fam. AMPHINOMIDÆ.

HERMODICE *Kinberg.*

Öfvers. Kong. Vetensk-Akad. Förhand., p. 11, 1857.

HERMODICE CARUNCULATA *Kinberg.*

(Plate VII, Figs. 1-5.)

gantea LINNÆUS. Syst. Nat. ed. 12, vol. i, p. 1086. 1776 (teste Baird).
a carunculata PALLAS. Miscell. Zoöl. p. 102, pl. viii, figs. 12, 13. 1766 (teste
trefages).
carunculata GMELIN. Linn. Syst. Nat., vol. i, p. 3113. 1789.
me carunculata BRUGIÈRE. Enc. Méth., art. Amphinome, p. 46. Atlas, pl. 60,
6, 7. 1789 (t. Baird).
ne carunculata CUVIER. Dict. des Sci. Nat., art. Amphinome, vol. ii, p. 72.
ne carunculata GRUBE. Fam. der Ann., pp. 40 and 122. 1851.
ne carunculata QUATREFAGES. Hist. Nat. des Ann., vol. i, p. 395. 1865.
na carunculata AUDOUIN ET M. EDWARDS. Littoral de la France, vol. ii, p
1834.
runculata SAVIGNY. Syst. des Ann., p. 61.
runculata LAMARCK. An. sans Vert. 1st ed., vol. v, p. 330; 2d ed., vol. v, p.
t. Baird).
runculata CUVIER. Règne Animal, vol. iii, p. 199, ed. Crochard, Annélides
figs. 4, 4 A.
runculata GRUBE. De Pleione carunculata. 1837.
runculata TREVIRANUS. Beob. aus der Zoöl., p. 53, pl. xi. 1839.
e carunculata KINBERG. Öfvers. Kongl. Vetensk-Akad, p. 13. 1857.
e carunculata BAIRD. Linnean Society, Journal, Zoöl., vol. x, p. 219, pl. iv,
3 a, b. 1868.

is a series of short flattened setæ along the anterior margin of tral ramus, from ten to fifteen in number, which seems not to en observed.

lorsal setæ are quite long, very delicate, simple, capillary.

ventral setæ are much shorter than the dorsal, differ much in diameter, and number of teeth found along their outer third.

are bluntly rounded and curved at the apex; others have a lunt tooth just back of the apex, on the side opposite the series

EURYTHOË *Kinberg.*

Öfvers. af Kongl. Vetensk-Akad. Förhandl., p. 13. 1857.

EURYTHOË MACROTRICHA Baird.

(Plate VII, Figs. 6–9.)

Amphinome macrotricha SCHMARDA. Neue Wirbell. Thiere, vol. i, part 2, p. 144, fi a, b, c, in text, and pl. xxxiv, fig. 290. 1861.
Amphinome macrotricha QUATREFAGES. Hist. Nat. des Ann. vol. i, p. 406. 1865.
Eurythoë macrotricha BAIRD. Linnean Society, Journal, Zoöl., vol. x, p. 225, pl. figs. 5 a, b. 1868.

Schmarda's description of this species is very short, and I am wi out information as to the original color of the specimens sent me. reference, however, is probably correct. On the anterior margin of ventral ramus is a series of short, flattened setæ, 6 to 9 in number (9). The ventral setæ are not so much curved externally as in Schmar figure.

The collection includes a single specimen belonging to this fam too much injured for identification.

Fam. CHRYSOPETALIDÆ.

BHAWANIA *Schmarda.*

Neue Wirbellose Thiere, vol. i, part ii, p. 164. 1861.

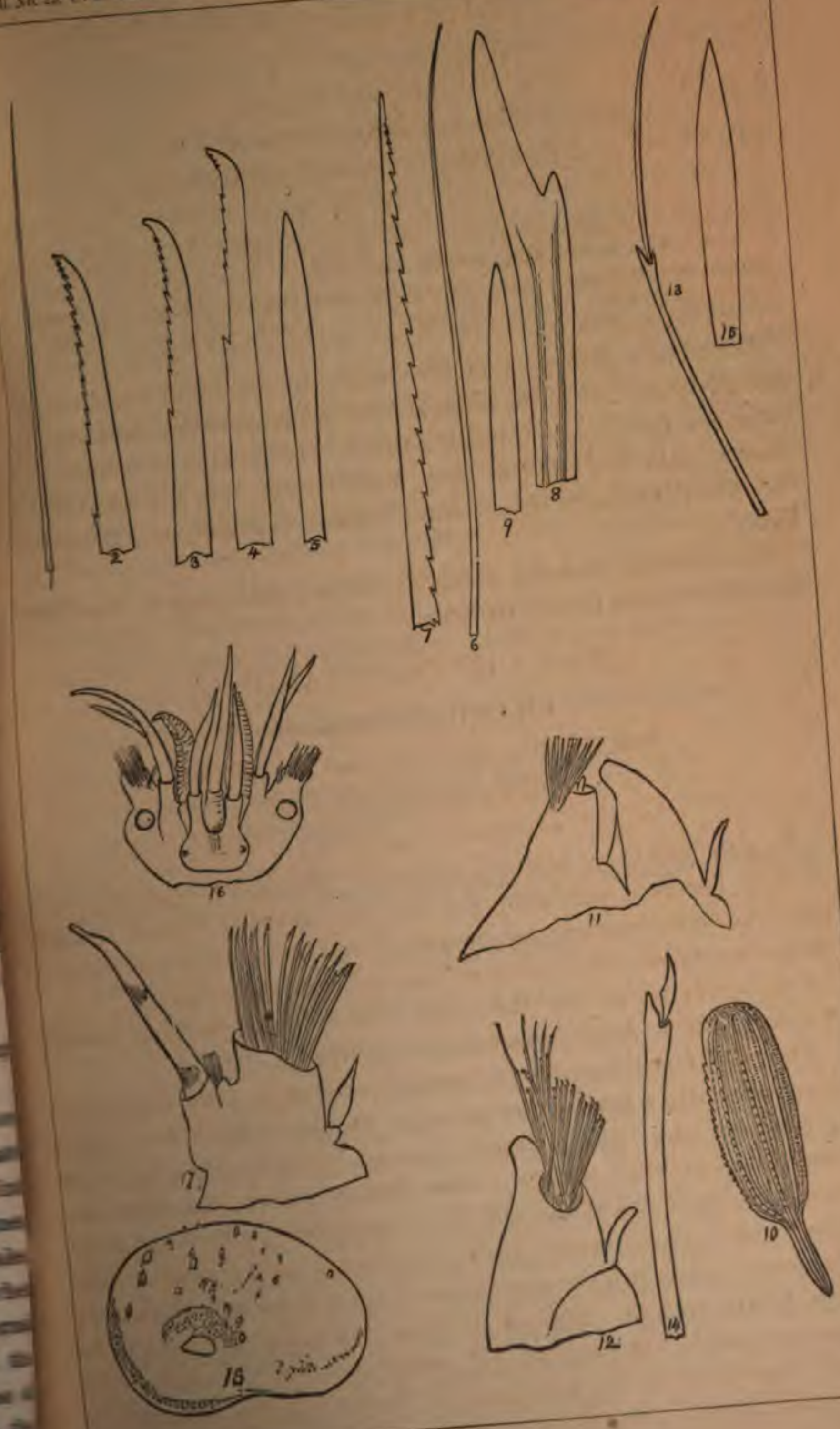
BHAWANIA GOODEI *n. sp.*

(Plate VII, Figs. 10–15.)

No good view of the head was obtained. The anterior segments cu directly forwards, embracing the head and reaching beyond it; p and setæ both projecting far beyond it, and in alcoholic specimen seems impossible to free the head from the surrounding parts.

On the ventral surface there is an oval caruncle reaching thro five segments, its length about double its breadth.

The palæ (Fig. 10) are broadly rounded externally, sides slightly vex, attached by a long narrow process. The inner edge is denticula to near the end. The surface is covered by numerous longitudi raised lines, of which three are wider than the others. All these li except the outer one of the wide lines, are covered with raised sca which are very numerous and small on the narrow lines, presenting, w moderately magnified, the appearance of series of beads. The exte wide band is smooth. Some of the raised lines are continued on insertion plate. The palæ are very numerous; from the middle lin each lateral half of the body they curve—the external, outward; rnal, inward. Fig. 10 represents one of the palæ taken


? plate

the middle line of the body; passing from this line outward they become somewhat narrower.

Feet biramous; ventral ramus (Fig. 12) a little longer than the dorsal, curved upward, tapering slightly from base to apex, bluntly rounded externally. It carries a finger-shaped cirrus which originates near the base of the ramus. Dorsal ramus (Fig. 11) somewhat conical, truncated externally, and bearing a short cirrus, which arises near the center of the truncated surface. The two rami are very close to each other. Setæ of the ventral ramus of two kinds, both compound; in the upper part of the bundle from two to six, elongate (Fig. 13), delicate, with long capillary appendix; all the others much shorter (Fig. 14), stouter, with short appendix. Setæ of dorsal ramus (Fig. 15) from ten to fifteen in number, all of one kind, thin, pointed, flattened, widest near the center; they arise from the upper side of the ramus. The anterior segments curve forwards, forming semicircles. All the segments are very narrow. After the fifth segment the body has a uniform diameter to the posterior third, after which it tapers uniformly to about one-half the greatest width. The falling off in width is also rapid along the first five segments.

Color, in alcohol, pale light-yellow; ventral surface yellowish, or reddish-brown.

Body slightly convex above; flattened below.

Length (largest specimen), 50^{mm}.

Width, 3^{mm}.

Specimen only 10^{mm} in length were also 3^{mm}, or even 3.5^{mm}, in width.

Fam. POLYNOIDÆ.

HALOSYDNA *Kinberg.*

Öfversigt Kongl. Vetensk-Akad. Förhand., p. 384. 1855.

HALOSYDNA LEUCOHYBA (*Schmarda*).

(Plate VII, Figs. 16–18. Pl. VIII, Figs. 19, 20.)

Polynoë leucohyba SCHMARDA. Neue Wirbellose Thiere, vol. i, part ii, p. 153, figures in text a, b, c, pl. xxxvi, fig. 308. 1861.

Polynoë leucohyba QUATREFAGES. Hist. Nat. des Ann., vol. i, p. 251. 1865.

? *Antinoë leucohyba* BAIRD. Linnean Society, Journal, vol. viii, p. 193.

The width of the head, back of the bases of the antennæ, exceeds the length (Fig. 16). The head is slightly convex above, with a central depression extending about one-half of the way back from the anterior margin; sides strongly convex; posterior margin straight; bases of the lateral antennæ as long as the rest of the head.

There are, probably, four eyes, but in the alcoholic specimens only two could be seen; these were lateral, circular, large, on the median line.

Antennæ smooth, cylindrical to near the apex, then tapering suddenly; median antenna about one-third longer than the lateral.

Superior tentacular cirrus about equal in length to the median antenna; inferior cirrus as long as the lateral antennæ.

Palpi triangular, stout, tapering uniformly to near the end, terminating in a small conical process; their margins are scalloped, and their surfaces thrown into folds by deeply impressed lines; length about that of the lateral antennæ.

There are eighteen pairs of elytra. (Schmarda gives seventeen in the text; in the figure, seventeen on one side, eighteen on the other). The first pair, circular; the others, oval (Fig. 18); slightly emarginate along the anterior margin; covered with small, white, rounded papillæ on their exposed surface, becoming more numerous on the posterior elytra.

The feet are quite stout; dorsal ramus (Fig. 17) minute; ventral ramus divided into two parts by slight longitudinal constrictions; dorsal cirri arising from stout basal articles, reaching a little beyond the ventral setæ; ventral cirri of first pair as long as the dorsal cirri, and similar to them in all respects, directed forwards. After the first pair they arise from minute basal articles, are fusiform, reach to the end of the ventral ramus.

There are from 6 to 10 dorsal setæ (Fig. 20), short, acute, broad at base, transversely serrate. Ventral setæ (Fig. 19) stout, bi-dentate, except those of the first segment, which end in a single point. They are in two bundles, but are all of one kind.

Exposed part of elytra, blue; covered part, grayish-white; papillæ of elytra, white; body, beneath the elytra, blue; anterior part of head and bases of elytra, blue; posterior part of head with numerous black pigment spots; feet and ventral surface, yellowish-white; dorsal cirri with a blackish band near the base, and another about two-thirds of the way out.

I refer the specimens sent me by Mr. Goode to *Polynoë leucohyba* SCHMARDA, though it will be seen that the figures differ, especially those of the setæ. Baird has doubtfully referred this species to *An[illegible]* KINBERG, but Fig. 16 shows that it cannot be so referred. Schmarda says nothing about the head.

Fam. HESIONIDÆ.

FALLACIA *Quatrefages.*

His. Nat. des Ann., vol. ii, p. 98. 1865.

FALLACIA PROCTOCHONA (*Schmarda*) *Qtrfg.*

(Plate VIII, Fig. 21.)

Hesione proctochona SCHMARDA. Neue Wirbellose Thiere, vol. i, part ii, p. 79, figure of seta in text, and pl. xxviii, fig. 226. 1861.

Fallacia proctochona QUATREFAGES. Hist. Nat. des Ann., vol. ii, p. 99. 1865.

At first it seemed that it would be necessary to institute a new genus for this species. Afterwards two minute papillæ were found on the anterior angles of the head, which are doubtless rudimentary antennæ. As they are too small to be seen even with an ordinary hand magnifying glass, it is not surprising that Schmarda failed to mention them. Mr. Goode collected nine specimens of this species, and the museum of Union College has a large number of specimens, collected by myself on the west cost of Florida, from Sarasota Bay to Key West. Schmarda states correctly in the text that there are sixteen tentacular cirri; his figure shows but fourteen. These, like the dorsal cirri, arise from long cylindrical basal articles. From Schmarda's figure they would seem to arise in a linear series; in fact they are in pairs, one above the other. The basal article of the ventral cirri is very short. The upper margin of the foot (Fig. 21) is prolonged into a conical cirrus. According to my Florida notes the antennæ are red. It is impossible to determine from alcoholic specimens how many segments bear tentacular cirri, but there appears to be but one.

The ante-anal segment has no pedal rami, nor setæ, but merely two long cirri, dorsal and ventral.

The anal segment has two long anal cirri, as long as the dorsal cirri. The anal opening is surrounded by a series of low, flattened, projections, with convex external margin, oval in form, about six in number.

It would appear that Schmarda's specimens had lost the anal cirri.

PODARKE *Ehlers.*

PODARKE OBSCURA *Verrill.*

VERRILL. Invert. Animals of Vineyard Sound, etc., p. 589; pl. xii, fig. 61. 1874.

WEBSTER. Annel. Chæt. of the Virginain Coast, p. 216. 1874. Annel Chæt. of New Jersey, p. 107. 1880.

The collection contains a few specimens much injured, but probably belonging to this species.

terior third with convex sides; posterior margin straight.

Eyes not very large, circular, lateral.

Antennæ about one-half as long as the head, removed fro other, at origin, by less than their own diameter; inserted in depressions of the anterior margin of the head; bluntly conical.

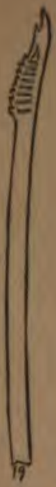
Palpi very long, not large, not tapering, with large terminal a which, in alcoholic specimens, are nearly spherical.

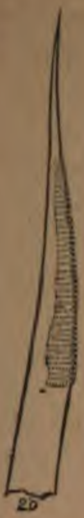
The buccal segment, in contracted specimens, has the same as the second segment; probably double that length in life.

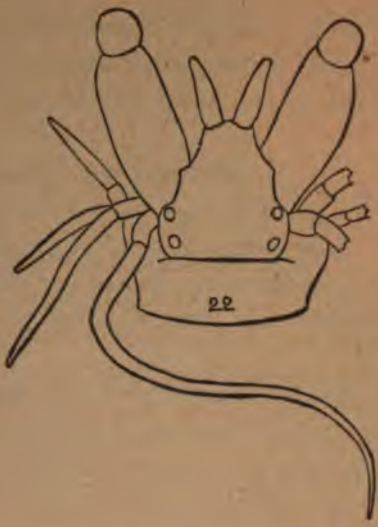
The maxillary ring of the proboscis is short (Figs. 22ª, 23); the nathi are complete; mostly conical; arrangement, i, irregula shaped; ii, double series, irregular; iii, two transverse, linear seri numerous, irregular; v, sometimes wanting, sometimes one, t three, small; vi, on each side a single, narrow, elongated tra denticle, ends rounded; situated on elevations (Fig. 22) whicl straight inner margins; outer margins straight to near the anteri when they curve inward; vii and viii in two series, the anteri posed of a few large denticles, the posterior more numerous and s

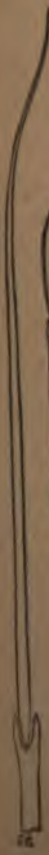
Tentacular cirri with stout cylindrical basal articles; the cirri selves delicate; the posterior superior longest, reaching back eighth segment; the others much shorter, as shown in the figur

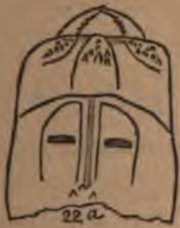
Feet rather stout and short; on the anterior segments (Fig. lingulæ and rami are nearly of the same length, stout, conical. cirrus arising from the upper margin of its lingula, stout, conic reaching quite to the end of the lingula. Ventral ramus bi-labia

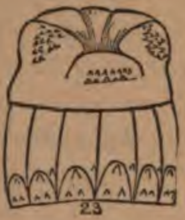

19

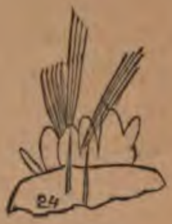

20

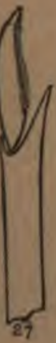

22

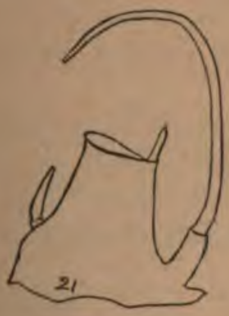

28

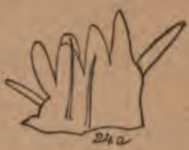

22 a

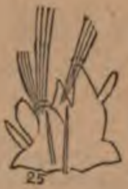

23

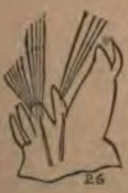

24

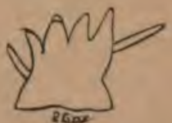

27


21


24a


25


26


26a

ral lingula retains its length but loses in diameter. The ventral is remains unchanged. Other specimens, certainly belonging to species, have the feet more delicate, the dorsal and ventral cirri a longer. (Figs. 24^{a}, 26^{a}.)

nal cirri filiform, as long as the last ten segments.

the dorsal ramus there are from 6–10 setæ (Fig. 28) with long ate appendix, the terminal points of the stem equally long. These form the upper part of the ventral bundle, while its lower part is e up of falcate setæ, appendix short (Fig. 27), terminal points of very unequal in length.

ody convex above, slightly convex below; of nearly uniform width the anterior three-fourths; tapering slightly along the posterior th, but appearing to retain a uniform diameter, on account of the gthening of the feet. A few of the anterior segments also taper htly.

ength, 35–50^{mm}.

Vidth, 3–4^{mm}.

umber of segments, 50-80.

NEREIS GRACILIS, *n. sp.*

(Plate IX, Figs. 29–35.)

lead wide (Fig. 29), slightly convex laterally and above, a little cone behind, produced in front to form the bases of the antennæ.

yes quite large, placed well in front; those on either side nearly in tact.

ntennæ with long cylindrical basal articles, produced from the head, within the anterior eyes; they are long, conical.

alpi long and stout, curved inward near the base; terminal articles e long; in contracted specimens they fall a little short of the annæ.

roboscis and jaws not seen.

n the specimen figured, which was otherwise in good condition, the erior superior tentacular cirri were both lost. On another specimen, h injured, this cirrus remained, and was found to be very long, hing back to the thirty-fourth segment, being nearly three times as as the anterior superior cirrus, which reaches to the twelfth segt; the inferior cirri are much shorter.

uccal segment produced forward along its anterior margin, encroacha little on the head; its length, in alcoholic specimens, is about of the next segment.

The dorsal cirri are very long and delicate; they have a stout basal article, which, on the anterior segments, is merged in the base of the upper lingula (Fig. 30); further back the lingula has the appearance of arising from the base of the cirrus (Figs. 31, 32). The dorsal cirri increase in length gradually, backward, and appear to gain much more than they really do, owing to the shortening of the other parts of the foot.

On the anterior segments the free portion of the upper lingula (Fig. 30) is about one-third as long as the dorsal cirrus, delicate, conical. The upper ramus is as long as the free part of the upper lingula, but falls a little short of its apex; in form it is like the lingula. The ventral ramus is bi-labiate, the anterior lip much the longest, conical, and minute at extremity (Fig. 30); basal three-fourths stout, with strongly convex sides. The posterior lip is very broad, completely concealing the base of the anterior lip in a posterior view (Figs. 30, 32); sides nearly straight, apex bluntly and irregularly rounded. The inferior lingula is long, conical, swollen at base. The ventral cirrus arises some distance within the base of the ventral lingula, and reaches nearly to its apex; it is very delicate, conical.

There is a progressive diminution in size of all parts connected with the feet from before backward, with the exception of the cirri; the lingulæ, especially, become much smaller, falling short of the rami; but the cirri elongate, the ventral cirrus finally reaching beyond both lingula and ramus.

The setæ are of three kinds: those of the dorsal ramus for the most part with delicate capillary appendix; the points of the stem nearly equal in length (Fig. 33); with these, in the lower part of the bundle, a few falcate setæ (Fig. 35); in the ventral ramus there are two bundles of setæ; the upper bundle is composed mostly of setæ with appendix similar to those of the first kind, but with one of the terminal points of the stem much longer than the other (Fig. 34); there are also a few of the other two forms; the setæ of the lower bundle are mainly falcate (Fig. 35), with also a few similar to Fig. 34.

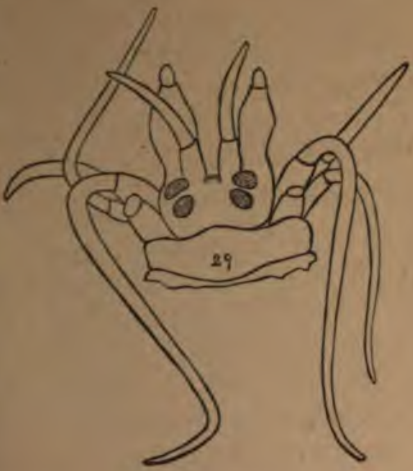
Anal segment simple, cylindrical; anal cirri as long as the dorsal cirri, and like them in all respects.

Body strongly convex above; slightly convex below; tapering a little along a few of the anterior segments, and also along the posterior third.

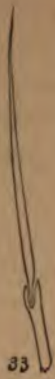
Length of only entire specimen, 60^{mm}.

Width, 4.5^{mm}.

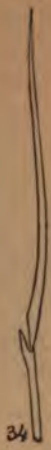
Number of segments, 92.



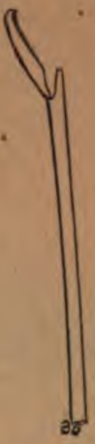
29



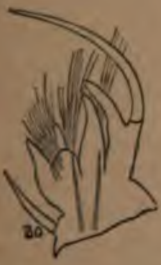
33



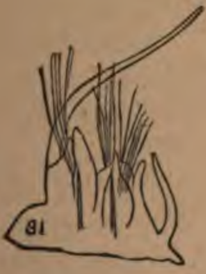
34



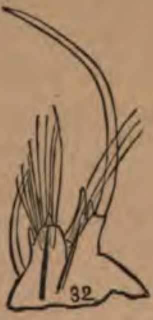
35



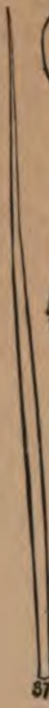
30



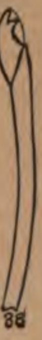
31



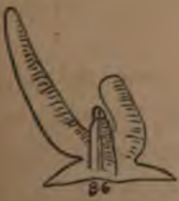
32



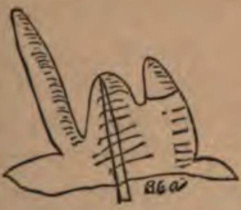
37



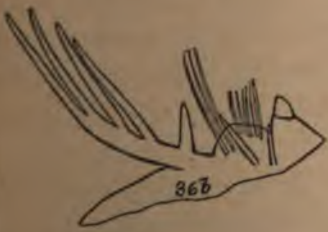
38



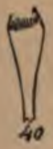
36



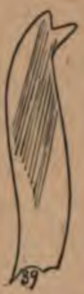
36a



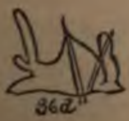
36b



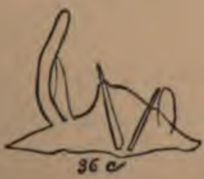
40



39



36d



36c

Fam. EUNICIDÆ.

EUNICE *Cuvier*.

EUNICE MUTILATA, *n. sp.*

(Plate IX, Figs. 36, 36*a*–*d*—40.)

This species is represented in Mr. Goode's collection by an anterior fragment composed of 39 segments, length 30^{mm}; and by a posterior fragment, 180 segments, length 90^{mm}. These may have belonged to the same specimen, but do not make up the whole of any specimen, an intermediate part, of unknown length, being lost.

The head is distinctly and deeply bi-lobed.

The antennæ rather delicate, cylindrical, smooth, bluntly rounded at apex; median antenna 3.5^{mm} in length, reaching back to the middle of the fifth (third setigerous) segment; inner pair, length 3^{mm}; outer pair a mere trifle shorter than the inner.

Eyes small, black, circular, between the bases of the paired antennæ.

Buccal segment equal in length to the three segments following it, taken together; second segment a little shorter than the third.

Tentacular cirri as long as the buccal segment, conical, apex blunt.

The branchiæ begin on the seventh setigerous segment; on the seventh, eighth, and ninth segments, a single filament; on the tenth, eleventh, and twelfth, two filaments; on the thirteenth, fourteenth, and fifteenth, three filaments; from the sixteenth to the thirty-seventh, four filaments (Fig. 36*b*); on the posterior fragment the branchiæ have but a single filament (Fig. 36*c*), becoming very delicate and short on the posterior segments (Fig. 36*d*).

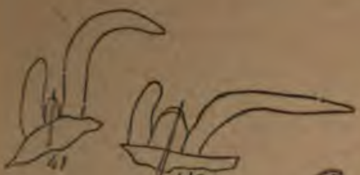
The dorsal cirri, largest on the first setigerous segment (Fig. 36), growing progressively smaller (Fig. 36*b*); at first finger-shaped, then conical. On the first segment of the posterior fragment this cirrus shows considerable increase in length, but is shorter than the branchia (Fig. 36*c*); while on the last segments (Fig. 36*d*), though the length of the cirrus is about the same, it is much longer than the branchia.

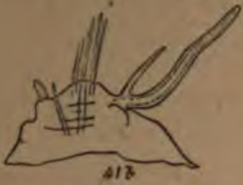
The ventral cirri are stout, conical, base swollen; outer third, on anterior segments, cut off by a shallow constriction; longest on first segments.

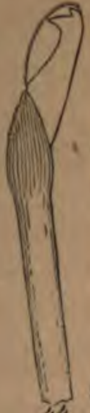
Anal segment cylindrical, small. Anal cirri short.

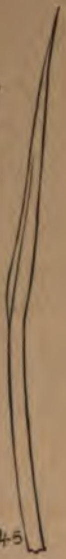
The upper (capillary) (Fig. 27) setæ are very long and delicate; longest on the posterior third. The comb-like setæ (Fig. 40) have their outer

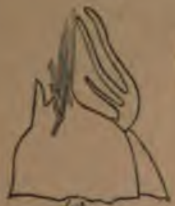
PLATE X.

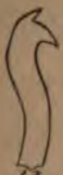

41 41a

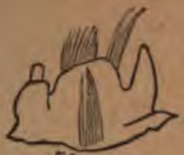

41b

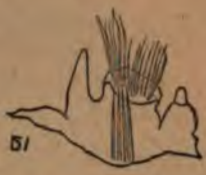

44

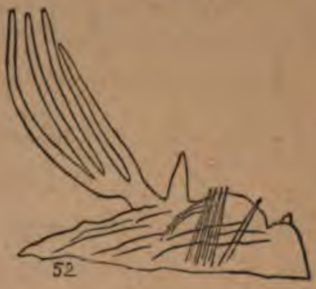

45

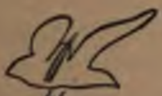

42

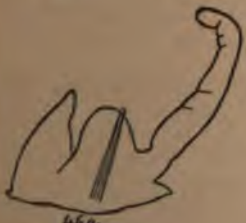

43

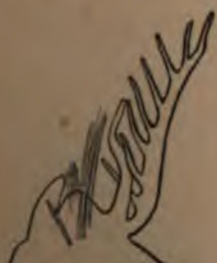

50

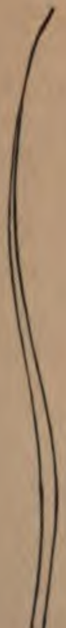

51

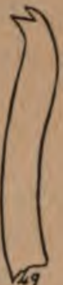

52

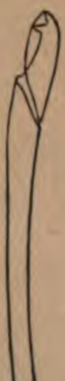

46

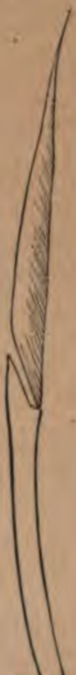

46a


46b


47


49


48


53

The lower acicula (Fig. 45) is curved externally, and has two sharp, triangular, teeth, of which the lower is very large.

Body slightly convex above, flattened below; segments numerous, short; on the largest specimen, at the widest part of the body, there were four segments, in a length of 1^{mm}.

Anal cirri lost on all our specimens. Color in alcohol, uniform yellowish-white.

Length of longest complete specimen, 60^{mm}.

Width, 3^{mm}.

Another specimen, posterior part lost, had a width of 4^{mm}.

The specific name is given in reference to the denticles on the stem of the compound setæ.

EUNICE LONGISETIS *n. sp.*

(Plate X, Figs. 46, 46 *a*, *b*–49.)

Head four-lobed, upper lobes small; antennæ smooth, median and median lateral reaching back to the fifth segment; lateral about one-half as long as the median.

The dorsal cirri are long and stout (Figs. 46, 46*a*, *b*,) on the branchiated segments, arising just at the base of the branchial stem.

Ventral cirri stout, reaching beyond the foot. Branchiæ begin on the sixth setigerous segment, at first as a single filament, delicate, shorter than the dorsal cirrus; further back the number of filaments increases to eight, carried on the side of a stout stem, which is nearly double the length of the dorsal cirri; on the posterior segments they become reduced to the same condition as on the anterior, but persist to the end.

The capillary setæ are very long, reaching nearly to the end of the dorsal cirri (Fig. 47); the compound setæ are about one-half as long as the capillary, terminal teeth sharp (Fig. 48), nearly at right angles to each other.

In the upper part of the foot are two or three sharp aciculæ, projecting slightly; in the lower part, and extending into the ventral cirrus, a single, curved, bi-dentate acicula (Fig. 49).

Body convex above; flattened below; anal segment short; anal cirri two, in all respects similar to the dorsal cirri.

Color (in alcohol), dark reddish-brown. Fourth setigerous segment white. Antennæ, tentacular cirri, and dorsal cirri evidently banded with white and some other color in life, but with only slight traces of such marking remaining. Aciculæ black.

Buccal segment as long as the four following segments together; second segment short, not well defined above; tentacular cirri about one-half the length of the buccal segment.

Number of segments, 107.

Length, 40^{mm}.

Greatest width, 4^{mm}.

EUNICE LONGICIRRATA *n. sp.*

(Plate XII, Figs. 75–80.)

Head distinctly four-lobed; upper lobes narrow, but somewhat elongated. Median antennæ reaching back to the eleventh segment; median lateral also long, reaching to about the eighth segment; lateral about one-half as long as the last. They are all very delicate, smooth.

The buccal segment is as long as the next three segments. The second segment is nearly as long as the third, plainly set off from the first both above and below; its tentacular cirri are very delicate, acutely conical, reaching forward to the middle of the head.

The dorsal cirri on the anterior segments are large and long (Figs. 75–77), irregularly wrinkled; they diminish in size very gradually backward to the middle of the body; behind the middle they again gain in diameter and length, but are never so large as on the anterior segments.

The branchiæ begin as a single filament on the third setigerous segment (Fig. 76); on the next segment they have 6 subdivisions, on the next from 12 to 15. This number they retain to about the thirty-third segment; then for the next ten segments the filaments gradually become fewer; from about the forty-third to the fifty-third there is but one filament; after this they disappear. The branchiated segments form about one-third the length of the body.

The anal cirri are in two pairs; one quite short, blunt; the other as long as the last twelve segments taken together, every way similar to the antennæ.

The bidentate setæ have the form shown in Fig. 79; the outer tooth is quite long, bluntly rounded at apex; the lower sharp, triangular.

In the anterior segments there is one stout, projecting acicula, in the upper part of the foot; presently another is added; still further back a bidentate acicula (Fig. 80) appears, in the lower part of the foot, followed quickly by another of the same kind. Delicate setæ penetrate the [illegible] of the dorsal cirri.

The general color of the body (in alcohol) is yellowish-white; beautifully irridescent.

Body strongly convex above; flattened below.

Length (about), 110^{mm}.

Greatest width, 4^{mm}.

There is a gradual diminution of diameter along the posterior third.

EUNICE VIOLACEA *Grube.*

Eunice violacea, Grube. Annulata Örstediana p. 57. 1856.
Eunice violacea Quatrefages. Hist. Nat. des Annel., vol. i, p. 326. 1865.
Eunice Roussæi Ehlers. Die Borstenwürmer, p. 309. 1868.

Ehlers' identification of *E. violacea* Grube with *E. Roussæi* Quatr. seems at best very doubtful. In the former, the branchiæ appear on the sixth segment; in the latter, on the tenth, and both descriptions seem to have been made from adult forms. Our material is hardly sufficient to decide the question positively.

MARPHYSA *Quatrefages.*

MARPHYSA ACICULARUM *n. sp.*

(Plate X, Figs. 50–53.)

Head broad, distinctly bi-lobed; lobes very broadly rounded in front; antennæ smooth, tapering but little; median and median pair about three times as long as the head; lateral pair a little shorter than the last; eyes two, black, between the bases of the paired antennæ.

Buccal segment double the length of the following segment; second segment a trifle shorter than the third.

Dorsal cirri (Figs. 50–52) stout, conical, retaining about the same length throughout; ventral cirri on the anterior half of the body borne on a stout cylindrical process, which becomes smaller on the posterior part of the body.

The branchiæ begin (on adult specimens) on the twenty-fifth to twenty-ninth setigerous segment, at first as a single filament, shorter than the dorsal cirrus. The filaments soon increase in number to four (Fig. 52), but on the posterior segments become again reduced to one very minute filament.

The superior (capillary) setæ are about double the length of the inferior, and of the ordinary form. The form of the inferior setæ is shown in Fig. 53.

There are from three to five sharp, black aciculæ in each foot, scarcely

The first ten segments are rounded; their length a little more, the diameter a little less, than that of the segment following. After th tenth segment the body is much depressed; very slightly convex abov flat below; along the posterior third the body is somewhat more conve and diminishes gradually in diameter.

Length, 120^{mm}.

Greatest width, 6^{mm}.

Color (in alcohol), dirty white, somewhat iridescent.

NICIDION *Kinberg.*

NICIDION KINBERGI *n. sp.*

(Plate XII, Figs. 81-88.)

This genus is represented in Mr. Goode's collection by a single spec men, of which the posterior segments are lost. What remained is i good condition, and it seems desirable to describe it, as well as may b because so few species of the genus have been found.

The head (Fig. 81) is bi-lobed, convex above and at the sides; th median antenna reaching back to the third segment; the paired antenn a little shorter than the median; eyes small, circular, black, situat back of the origin of the lateral antennæ.

The buccal segment is nearly as long as the three following segmen together; the second segment perfectly well marked, as long as th third; the tentacular cirri were lost, merely a short basal part remainin

The dorsal cirri on the anterior segments are stout, irregularly an bluntly conical (Figs. 82, 83); further back they become somewh smaller (Fig. 84). The ventral cirri on a few of the anterior segmen (Fig. 82) are as long as the dorsal, finger-shaped; soon they becon much swollen at base (Fig. 83), and then fall off rapidly in size, bei hardly perceptible on the posterior segments of our fragment (Fig. 8

The capillary setæ are widened for a part of their length (Fig. 86 and then drawn out into a delicate capillary termination. The com pound setæ have the form shown in Fig. 85. There are many comb-lik setæ (Fig. 87), with their teeth curved and prolonged, especially one the outer teeth.

In the anterior feet there is a single stout acicula, straight, pointe slightly projecting; further back appears a bi-dentate acicula, in th lower part of the ramus (Figs. 84, 85).

Body strongly convex above, flat or slightly concave below.

Color, in alcohol, white.
Length of seventy segments, 14^{mm}.
Diameter, 1.2^{mm}.

ARABELLA (*Grube*) *Ehlers*.

ARABELLA OPALINA *Verrill*.

Lumbriconereis splendida LEIDY. Marine Invert. Fauna of R. I. and N. J., p. 10. 1855.
Lumbriconereis opalina VERRILL. Invert. Animals of Vineyard Sound, in Report of U.S. Commissioner of Fish and Fisheries, Part II, p. 342, pl. xiii, figs. 67, 70. 1874.
Arabella opalina VERRILL. Proc. Acad. Nat. Sci. Phila. for 1878, p. 299.
Arabella opalina WEBSTER. Annel. Chæ. of the Virginian Coast, etc., p. 242. 1879. Annel. Chæt. of N. J., p. 116. 1880.

This species, on our coast, certainly ranges as far north as Cape Cod, and as far south as Beaufort, N. C.

ŒNONE (*Savigny*) *Ehlers*.

ŒNONE DIPHYLLIDIA *Schmarda*.

Plate XII, Figs. 89–91.

Œnone diphyllidia SCHMARDA. Neue Wirbel. Thiere, vol. i, part ii, p. 120, pl. xxxii, fig. 256 (also figures in text). 1861.
Andromache diphyllidia KINBERG. Annulata Nova, p. 571. 1865.
Œnone diphyllidia QUATREFAGES. Hist. Nat. des Ann., vol i, p. 374. 1865.
Œnone diphyllidia EHLERS. Die Borstenwürmer, p. 407. 1868.

In preserved specimens the "frontal tentacles" of Schmarda (Mundpolster, Ehlers) are hardly visible.

The anterior feet with all their appendages are shorter and wider than those further back (Fig. 90). After the first few segments there may be from one to three stout bi-dentate setæ in the lower part of each ramus.

Ehlers' remarks upon this genus and species seem to be accurate in every respect.

Fam. ARICIIDÆ.

ANTHOSTOMA *Schmarda*.

Anthostoma ramosum SCHMARDA. Neue Wirbellose Thiere, vol. i, part ii, p. 62 (figs. of feet and setæ in text).

The collection contained but one specimen of this species, and that very badly injured, but sufficient for identification.

Fam. OPHELIIDÆ.

OPHELINA *Örsted.*

Grube, in his Annulata Semperiana (p. 193), arranges the genera of this family in the following manner:

Ophelina Örsted; type, *Ammotrypanne aulogaster* Rathke.
Ammotrypane Rathke; type, *Ammotrypane limacina* Rathke.
Ophelia Savigny; type, *Ophelia bicornis* Savigny.

This arrangement seems to be correct, and accordingly the following species has been referred to *Ophelina.*

OPHE[illegible]LATA *n. sp.*

(Plate XI, Figs. 54, 55.)

Head as long as the first three segments taken together, terminating in a delicate, elongated, conical process, which is set off by a shallow constriction.

There are three eyes, forming a transverse series, near the posterior margin of the head, very small, the middle one largest. The first segment is quite short; from the first to the seventh the segments increase gradually in length; after the seventh they are of uniform length, except the last four, which are shorter.

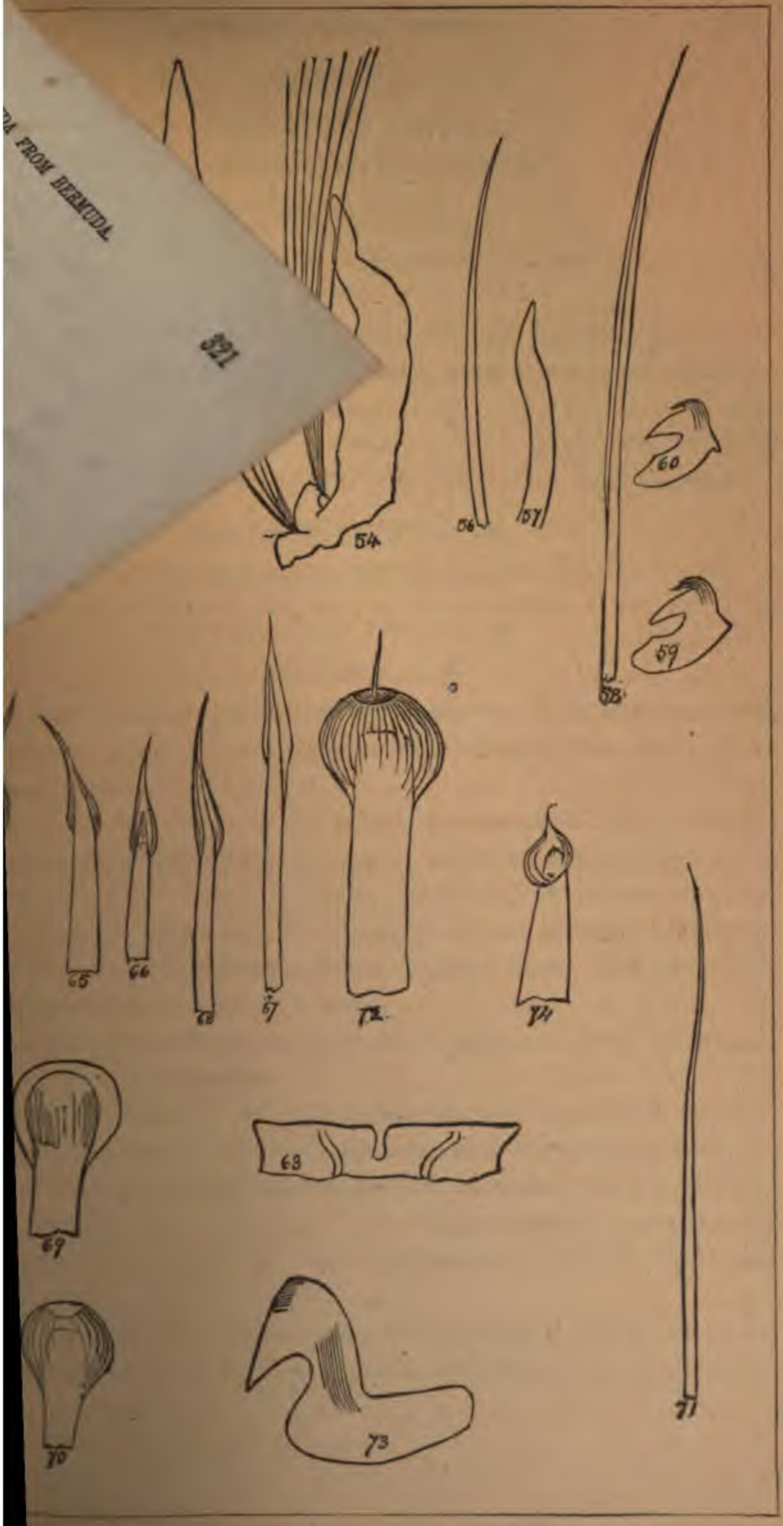
The outline of the [illegible] and relative length of the setæ are shown in Figs. 54, 55.

The branchiæ begin on the second segment; on all our specimens there are [illegible] pairs of branchiæ, with one exception, where there are 24 on one side, [illegible] on the other, leaving three non-branchiated setigerous segments. It is possible that the branchiæ have been lost from some or all of these segments, as we have but few specimens, and in all the posterior segments are somewhat injured.

The branchiæ are densely ciliated.

[illegible] segment a circular black spot appears on the side of [illegible], close to the origin of the branchiæ. These spots are [illegible] segments; they then become elongated, narrow, and [illegible].

[illegible] (in alcohol) is pearl-gray. In every case the anal [illegible] appeared to admit of determining the number of the [illegible] of them are bi-furcate at extremity.



Fam. THELETHUSIDÆ.

ARENICOLA *Lamarck.*

ARENICOLA CRISTATA *Stimpson.*

STIMPSON. Proc. Boston Soc. Nat. His., vol. v, p. 114.
QUATREFAGES. Hist. Nat. des Ann., vol. ii, p. 673. 1865.

The posterior (non-branchiated) segments of this species are set off from each other by deep constrictions.

On the first segment, back of the branchiæ, the feet are represented by two stout conical cirri on either side, distant from each other by about the diameter of the base of each.

On the remaining nine segments there is but a single cirrus on each side, and these pass to the ventral surface, and stand close together.

Fam. CIRRATULIDÆ.

CIRRATULUS *Lamarck.*

CIRRATULUS TENUIS *n. sp.*

(Plate XI, Figs. 56, 57.)

Head short, bluntly rounded in front; no eyes. First three segments without setæ or cirri. Third segment a little longer than the fourth; as long as the first two together.

Lateral branchiæ begin on the fourth segment, and exist, on the anterior third of the body, on all segments; not so numerous further back.

Dorsal branchiæ on the fifth, sixth, and seventh setigerous segments, two or three on each side of each segment; not forming a complete transverse series, but leaving a naked median space. Branchial cirri all long, not differing from each other.

The setæ of the anterior segments are capillary in both rami, long, delicate, 7–10 in each fascicle.

At about the fifteenth setigerous segment the ventral setæ begin to be replaced by uncini, and after a few segments the capillary setæ disappear. There are at first three of the ventral uncini; then two; while on the posterior segments there is but one to each ramus. At about the twentieth setigerous segment uncini appear in the dorsal rami; both kinds of setæ remain to the end.

The body is convex above, compressed, flattened below; segments very short but distinctly defined; from the middle the diameter decreases slightly, backward.

Number of segments, 110.

Length, 30^{mm}.

Diameter, 2^{mm}.

Fam. TEREBELLIDÆ.

TEREBELLA (*L.*) *Malmgren.*

TEREBELLA MAGNIFICA *n. sp.*

(Plate XI, Figs. 58–60.)

The tentacles are very numerous, stout, three-fourths as lo body, even in alcoholic specimens.

The branchiæ of the first pair are large and long (12^{mm} second, one-half the first; of the third, one-half the second: before giving off branches, forms one-half the length. The have numerous brown specks on their stems and branches.

Seven segments, beginning with the second branchiated small, conical papilla or cirrus, placed between the two rami; similar cirrus at a corresponding place on the first branchiated

The ventral surface of the second segment is raised into a t on either side of the middle line, widening externally; a some ilar structure, but not so well marked, occurs on the third a segments. Back of the fourth segment are the ventral plate in number, of uniform width, their anterior and lateral marg ened and separated by an impressed line from the body of t The width of the first plate is five to six times its length; the progressively narrower, until on the last plate the width and l about equal. As the ventral plate becomes narrow the uncig widen.

An impressed line running just in front of the pedal ram each segment into two parts; very distinctly above, less so be

The body retains a uniform diameter to the posterior six which it tapers somewhat rapidly, the diameter of the anal being about one-half that of the middle segments.

Length, 160^{mm}.

Diameter, 8^{mm}.

Number of segments on specimen measured, 135.

Color in alcohol, yellowish-white.

ENOPLOBRANCHUS *Verrill.*

ENOPLOBRANCHUS SANGUINEUS *Verrill.*

Chætobranchus sanguineus VERRILL. Invert. Animals of Vineyard Sound, p.
Enoplobranchus sanguineus VERRILL. Check-List.
Enoplobranchus sanguineus WEBSTER. Annel. Chæt. of the Virginian Co 1879.

The collection contains a few specimens, all much injured, belonging to this peculiar genus, and probably also to Verrill'

Fam. SABELLIDÆ.

PROTULIDES *n. g.*

Branchiæ united along their inner part by membrane.

Setæ of first segment in an oblique double series. Uncini in two series and of two kinds on all segments. Anterior dorsal setæ of two kinds. Collar complete, save for a narrow dorsal incision; not reflexed. Ventral sulcus continued on the dorsum.

This genus is closely related to *Potamilla* MALMGREN, but differs from it in the character and arrangement of the setæ of the first segment, in the continuation of the ventral sulcus on the dorsum, and in having two rows of uncini on the abdominal segments.

PROTULIDES ELEGANS *n. g.*, *n. sp.*

(Plate XI, Figs. 63–74.)

The branchial cirri are from nine to fourteen on each side, base forming a semicircle; they arise from a long undivided basal part, one-half as long as the cirri themselves; pinnæ elongate, delicate; short terminal part of the cirrus without pinnæ.

There are two series of minute eye-specks, one about two-thirds of the way out on the cirri, corresponding to the space occupied by six or seven pinnæ; another, still further out. These eyes cannot be seen in alcoholic specimens.

Tentacles flattened, triangular, length about one-fourth that of the branchiæ.

The first segment is double the length of the second, complete save for a narrow dorsal incision (Fig. 63).

There are from six to eight thoracic segments, the variation in number not depending on size, as some of the largest specimens have but six segments. Posterior segments short; numerous.

The setæ of the first segment are in two series, which run obliquely from before backward, along the entire length of the segment. All these setæ are dilated at the end, and have a capillary apex; they do not differ from each other much in form (Figs. 64–66); there are about forty setæ in each row; they barely project from the surface.

Setæ of remaining thoracic segments of four kinds: In the dorsal ramus, from 4 to 5 long bi-limbate setæ (Figs. 67, 68); below these a double series of short setæ, with dilated globular extremities (Figs. 69, 70) without capillary terminations. In the ventral ramus are the two forms shown in Figs. 73 and 74; these are arranged in two long series. After the change of setæ (*i. e.*, on the abdominal segments) the uncini remain without modification (Figs. 73, 74); the ventral rami carry a few very long capillary setæ (Fig. 71), and others with dilated end, from the depressed summit of which arises a very delicate capillary appendix or apex (Fig. 72); further back both kinds of ventral setæ become somewhat elongated, and, in particular, the capillary termination of the setæ with expanded ends doubles in length.

The body is convex above, flattened below; of uniform width for the anterior four-fifths, falling off gradually along the posterior fifth to one-half the anterior width.

The base and cirri of the branchiæ are purple, except the base of the superior cirrus on each side, which is white; pinnæ, to the outer margin of the connecting membrane, purple; then, for a short distance, white; next, for a longer distance, purple; followed by another short white series. Terminal pinnæ, purple; naked terminal part of cirri, colorless. Where the pinnæ are white the sides of the cirri are also white, but the dorsum of the cirri is always purple. Young specimens have the cirri umber-brown or brown, with a tinge of purple; pinnæ colorless, white or greenish-white. The first segment has its anterior margin white; dorsum and sides dark umber-brown; ventral surface, for anterior two-thirds same as the dorsum, then a narrow white line, while the posterior part of this surface is dark flesh-color. Remaining thoracic segments, umber-brown; dorsal rami of this part of the body, dark flesh-color. Abdominal segments light flesh-color. On the anal segment two umber-brown spots (? eyes) which cannot be made out in preserved specimens.

This species forms a very tough membranous tube. The description given above is largely drawn from notes on specimens found at Beaufort, N. C., in 1876, by the Union College zoölogical expedition of that year. Most of the specimens found at Beaufort had their tubes imbedded in fragments of a soft oölite just below low-water mark. Two specimens were found with these tubes attached to shells.

A specimen with something over a hundred segments, measured while living, gave—

Length, 26^{mm}.

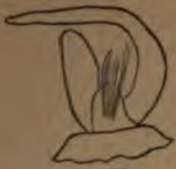
Breadth, 2^{mm}.

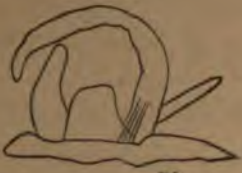
From front margin of collar to tip of branchiæ, 5^{mm}.

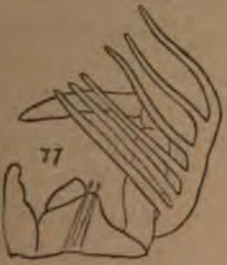
Another specimen:

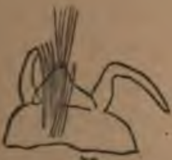
50^{mm}.

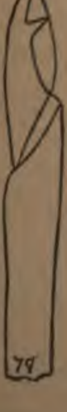
5^{mm}.

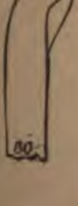

75

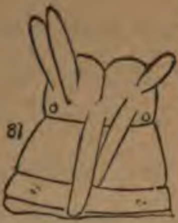

76

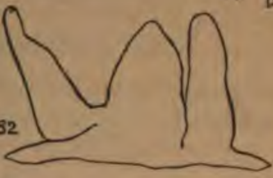

77

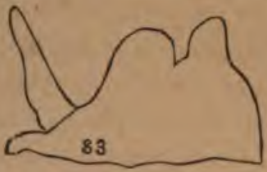

78

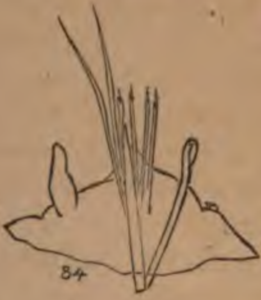

79

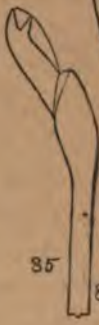

80

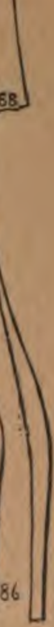

81

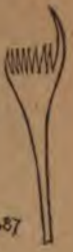

82

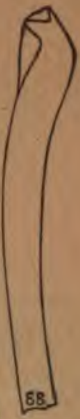

83

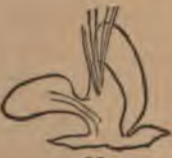

84

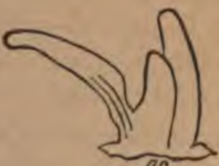

85

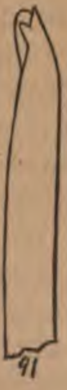

86


87


88


89


90


91

SABELLA (*L.*) *Malmgren.*

SABELLA MELANOSTIGMA *Schmarda.*

The collection contains a single specimen, without branchiæ, and otherwise injured, which probably belongs to Schmarda's species.

Fam. SERPULIDÆ.

HYDROIDES *Gunnerus.*

HYDROIDES DIANTHUS *Verrill.*

Serpula dianthus VERRILL. Invert. Animals of Vineyard Sound, p. 620. 1874.
Hydroides dianthus VERRILL. Proc. Acad. Nat. Sci., Phila., for 1878, p. 300.
Hydroides dianthus WEBSTER. Annel. Chæt. of the Virginian Coast, p. 266. 1879; of New Jersey, p. 128. 1880.

GENERAL INDEX.

[For index of Botany, see page 133.]

Page.

A.

, C 186, 257
rofessor 26
ylis pelasgia 209
or aurocapillus 184
ter 218
    ardosiacus 218
    fuscus 218
    haliaëtus 222
    palumbarius 218
    pennsylvanicus 218
    ruficaudus 220
    striatus 218
    velox 218
rinæ 218
, Lieut. S. M 297
bartramius 240
macularius 239
us 240
    bartramius 240
    longicaudus 240
omas bonapartii 236
    (Heteropygia) bonapartii 236
    maculata 235
    minutilla 235
omus melanotos 236
    minutilla 235
    wilsoni 235
us melodus 230
    semipalmatus 230
tis 229
    melodus 230
    semipalmatus 230
    vociferus 229
hus 195
    fuscescens 195
    linaria 195
    linarius 195
columbarius 219
næ 202

Page.

Aix 256
    sponsa 256
Alauda 178
    alpestris 177
    arvensis 167, 178
    cantarella 178
    cornuta 177
    dulcivox 178
    italica 178
    intermedia 178
    japonica 178
    ludoviciana 177
    montana 178
    pekinensis 178
    pennsylvanica 177
    rubra 177
    rufa 177
    vulgaris 178
Alaudidæ 177
Alaudinæ 177
Alca alce 278
    alle 278
    candida 278
Alcedinidæ 210
Alcedo Alcyon 210
    ludoviciana 210
Alcidæ 278
Alder, Corporal 255
Alectorides 246
Allen, C. M 6
Allen, H 145
Alopias vulpes 150
Ambergris 154
Amblyrhynchus 288
American Bittern 245
    common Crow 204
    Coot 250
    Flamingo 250
    Golden Plover 166, 228
    Goshawk 218
    Harrier 217

Page.
us spinoletta 177
noë 310
    leucohyba 309
rodita carunculata 306
ila haliætus 222
    (haliaëtus) leucocephalus 223
    leucocephalus 223
uilinæ 222
abella 321
    opalina 321
ramides (coturnicops) noveboracensis 247
    (creciscus) jamaicensis 248
    (mustelirallus) carolina 247
ramus (pardirallus virginianus 246
rchibuteo 221
    lagopus 221
    lagopus var. sancti-johannis 221
    sancti-johannis 221
dea 242
    adspersa 245
    alba 242
    (Ardeola) exilis 246
    (Botaurus) cœrulea 243
        violacea 245
        virescens 244
    callocephala 245
    candidissima 243
    carolinensis 243
    cayanensis 245
    chloroptera 244
    cœrulea 243
    cœrulescens 243
    discors 244
    egretta 242
    exilis 246
    freti-hudsonis 245
    gardeni 244
    herodias 242
    hoactli 244
    hudsonias 242, 245
    jamaicensis 245
    lentiginosa 245
    leuce. 242
    ludoviciana 244
    maculata 244
    minor 245
    mokoko 245
    nævia 244
    nivea 243
    nycticora 244
    sexsetacea 245
    stellaris var 245
        var. β 245

Page.
Ardea stellaris var. β. *minor* 245
    violacea 245
    virescens 244
Ardeidæ 242
Ardeinæ 242
Ardenna major 273
Ardeola exilis 246
Ardetta 246
    exilis 246
Arenaria vulgaris 237
Arenicola 323
    cristata 323
Ariciidæ 321
Aristonetta vallisneria 258
Arquatella maritima 236
Asio brachyotus 214
    galapagoensis 214
    peregrinator 213
    ulula 214
Astur 218
    atricapillus 218
    borealis 220
    columbarius 219
    fuscus 218
    palumbarius 218
        var. atricapillus 218
Athene wilsoni 215
Atricilla catesbyi 266
Attagen aquila 263
Auk, little 278
Austen, Capt. J. C 75
Ayland, Mr 59
Aythya 258
    vallisneria 258

B.

Baird, Prof. S. F 161
Balænidæ 147
Balanus 151
    mysticetus 152
Bald Eagle 223
Baltimore Oriole 203
Bank Swallow 189
Barbatia domingensis 31
Barn Swallow 188
Barred Owl 215
Bartram, J. T 13, 168, 169, 170, 171, 174, 179, 180, 181, 182, 183, 184, 186, 188, 190, 192, 194, 198, 199, 200, 203, 205, 206, 207, 209, 211, 213. 214, 217, 218, 219, 220, 221, 223, 224, 230, 243, 245, 250, 254, 261, 262, 263, 264, 265, 267, 269, 271, 272, 273, 274, 275, 276, 277, 278

Page.
- American Hawk Owl 217
  - Long-eared Owl 213
  - Night Heron 244
  - Pipit 177
  - Red Crossbill 193
  - Redstart 186
  - Robin 170
  - Rough-legged Buzzard 221
  - Snipe 166, 232
  - Sparrow-Hawk 220
  - Stint 235
  - Swan 251
  - Wigeon 255
  - Woodcock 232
- Ammodromus henslowi 197
  - palustris 198
  - savanna 197
- Ammotrypane 322
  - limacina 322
  - aulogaster 322
- Ampelidæ 190
- Ampelinæ 190
- Ampelis 190
  - americana 190
  - carolinensis 190
  - cedrorum 174, 190
  - garrulus 190
  - sialis 173
- Amphinoma caruncnlata 306
- Amphinome caruncnlata 306
  - macrotricha 308
- Amphinomidæ 306
- Anas 253
  - acuta 254
  - adunca 253
  - albeola 259
  - americana 255
  - boschas 253
  - (Boschas) crecca var 255
  - (Boschas) discors 256
  - (Boschas) domestica 253
  - bucephala 259
  - canadensis 252
  - carolinensis 255
  - caudacuta 254
  - caudata 254
  - (Chauliodus) strepera 254
  - clangula 258
  - clypeata 256
  - collaris 258
  - crecca 255
  - crecca var 255
  - curvirostra 253
  - discors 256
- Anas domestica
  - fera
  - freycineti
  - fuligula
  - (Fuligula) rubida
  - (Fuligula) rufitorques
  - glaucion
  - hyperboreus
  - jamaicensis
  - longicauda
  - marila
  - nivalis
  - obscura
  - perspicillata
  - rousseaui
  - rubens
  - rubida
  - rufitorques
  - rustica
  - sparmannii
  - sponsa
  - strepera
    - americana
  - vallisneria
  - vallisneriana
- Anatidæ
- Anatinæ
- Andromache diphyllidia
- Annelida from Bermuda 30
- Anous
  - fuscatus
  - l'herminieri
  - niger
  - plumbea
  - spadicea
  - stolidus
- Anser
  - canadensis
  - cærulescens
  - hyperboreus
  - niveus
  - parvipes
- Anserinæ
- Anthinæ
- Anthostoma
  - ramosum
- Anthus
  - aquaticus
  - hypogæus
  - ludovicianus
  - pennsylvanicus
  - pipicus
  - rebens
  - reinhardtii

Page.
Anthus spinoletta 177
Antinoë 310
  leucohyba 309
Aphrodita caruncalata 306
Aquila haliætus 222
  (haliaëtus) leucocephalus 223
  leucocephalus 223
Aquilinæ.. 222
Arabella 321
  opalina 321
Aramides (coturnicops) noveboracensis 247
  (creciscus) jamaicensis 248
  (mustelirallus) carolina 247
Aramus (pardirallus) virginianus 246
Archibuteo 221
  lagopus 221
  lagopus var. sancti-johannis 221
  sancti-johannis 221
Ardea 242
  adspersa 245
  alba 242
  (Ardeola) exilis 246
  (Botaurus) cœrulea 243
    violacea 245
    virescens 244
  callocephala 245
  candidissima.. 243
  carolinensis 243
  cayanensis 245
  chloroptera 244
  cœrulea 243
  cœrulescens 243
  discors 244
  egretta 242
  exilis 246
  freti-hudsonis 245
  gardeni 244
  herodias 242
  hoactli 244
  hudsonias 242, 245
  jamaicensis 245
  lentiginosa 245
  leuce. 242
  ludoviciana 244
  maculata. 244
  minor 245
  mokoko 245
  nævia 244
  nivea 243
  nycticorax 244
  sexsetacea 245
  stellaris var. 245
    var. *β* 245
Ardea stellaris var. *β*. *minor* 245
  violacea 245
  virescens 244
Ardeidæ 242
Ardeinæ 242
Ardenna major 273
Ardeola exilis 246
Ardetta 246
  exilis 246
Arenaria vulgaris 237
Arenicola 323
  cristata 323
Ariciidæ 321
Aristonetta vallisneria 258
Arquatella maritima 236
Asio brachyotus 214
  galapagoensis 214
  peregrinator 213
  ulula 214
Astur 218
  atricapillus 218
  borealis 220
  columbarius 219
  fuscus 218
  palumbarius 218
    var. atricapillus 218
Athene wilsoni 215
Atricilla catesbyi 266
Attagen aquila 263
Auk, little 278
Austen, Capt. J. C 75
Ayland, Mr 59
Aythya 258
  vallisneria 258

B.

Baird, Prof. S. F 161
Balænidæ 147
Balanus 151
  mysticetus 152
Bald Eagle 223
Baltimore Oriole 203
Bank Swallow 189
Barbatia domingensis 31
Barn Swallow 188
Barred Owl 215
Bartram, J. T.... 13, 168, 169, 170, 171, 174, 179, 180, 181, 182, 183, 184, 186, 188, 190, 192, 194, 198, 199, 200, 203, 205, 206, 207, 209, 211, 213, 214, 217, 218, 219, 220, 221, 223, 224, 230, 243, 245, 250, 254, 261, 262, 263, 264, 265, 267, 269, 271, 272, 273, 274, 275, 276, 277, 278

GENERAL INDEX.

Page.
Bartramia laticauda 240
Bartramius longicaudus 240
Bartram's Sandpiper............. 240
Bastard 301
Bat, Hoary.......................... 145
    silver-haired................ 145
Bay-winged bunting.............. 197
Bee-marten 205
Bell, Ebenezer...................... 10
Belted Kingfisher................ 210
Bendall 176
Bermuda, Annelida from 305, 306
    Birds of 163, 165
    Botany of.............. 33, 35
    Geology of............. 5
    Mammals of 143
    notes on rare or accidental birds from.... 283
    on a bird new to...... 281, 283
    Physical geography of. 6
    Reptiles of 285, 287
Bernicla 252
    canadensis 252
    (Leucoblepharon) canadensis 252
Bhawania 308
    goodei, new species ... 308
Bird, Frigate...................... 263
    Indigo 199
    Man-of-war................. 263
    Yellow-billed Tropic 263
Birds of Bermuda 163, 165
    of rare or accidental occurrencein the Bermudas 283
Bittern, American 245
    Least...................... 246
Biziura rubida 260
Black and Yellow Warbler...... 183
    bellied Plover 228
    billed Cuckoo 211
    Creeping Warbler 179
    Duck 253
    Rat 157
    Tern 271
Blackbird, Cow................... 203
Black-necked Stilt 231
Black-vented Shearwater....... 276–277
Bland, Colonel.................... 169
Blue-bill 257
Bluebird, Eastern 173
Blue-eyed Yellow Warbler...... 180
    tails 288
Blue-winged Teal................ 256
Blue Yellow-backed Warbler ... 179

Bob-o-link ....
Bombycilla americana ....
    carolinensis..........
    cedrorum ....
Bonaparte.......................... 219
Bonaparte's Gull..................
    Sandpiper ....
Booby Gannet.....................
Botanical names, Index of ......
Botany of Bermuda ....
Botaurus ....
    freti-hudsonis ....
    lentiginosus............
    minor ....
    nævius ....
Brachyotus.........................
    galapagoensis ....
    palustris ....
Branta canadensis ....
    (Leucoblepharon) canadensis..........
Brown Creeper....................
    Lark.......................
    Pelican ....
    Rat ....
Bubo albifrons....................
Bucephala albeola ....
    americana ....
    clangula............
Buffle-head........................
Bulla media ....
Bunting, Bay-winged ....
    Henslow's ....
    Snow ....
Butaëtes Sancti-Johannis ....
Buteo ....
    americanus...............
    ater........................
    borealis ....
    (Craxirex) borealis ....
    ferrugineicaudus ....
    fulvus......................
    lagopus ....
    niger ....
    Sancti-Johannis ....
    spadiceus ....
Buteoninæ ....
Butor americana..................
    exilis ....
    lentiginosus ....
Butorides virescens ....
Butter-ball.........................
Buzzard, American rough-legged
    eastern red-tailed .....

C.

Page.
.... 274, 275
s 236
americana 237
arenaria 236
tringoides 237
ell, Rev. J. U 279
goose 252
-back duck 258
a caretta 300
dussumierii 301
elongata 301
olivacea 301
e 300
hale 147
ulgidæ 208
ulginæ 208
ulgus americanus 208
(chordeiles) virginianus 208
popetue 208
virginianus 208
lilophus 262
al Grosbeak 200
alis 200
virginianus 175, 200
lis elegans 196
.... 299
bissa 300
caouana 300
cephalo 300
imbricata 299, 300
mydas 302
olivacea 301
rostrata 300
squamata 300
squamosa 300
thunbergii 301
, Sir Dudley 155
Dove 225
Rail 247
ers, James 6
l 172
sta aura 224
es 224
aura 224
iota 224
idæ 224
ophorus semipalmatus 237
ird. 190
chelys oceanica. 301
sis sparverius 220
um versicolor 31
.... 176
americana 176

Page.
Certhia familiaris 176
maculata 179
mexicana 176
varia 179
Certhiadæ 176
Certhiinæ 176
Cetacea 146
Ceryle 210
alcyon 210
Chætobranchus sanguineus 324
Chætura 209
pelagica. 209
pelasgia 209
Chæturinæ 209
Chama lingua-felis 31
macerophylla. 31
Chamberlain, John 155
Chamæpelia 225
albivita 225
granatina 225
passerina 225
Charadriidæ 228
Charadriinæ 228
Charadrius 228
(Ægialitis) hiaticula var. semipalmatus. 230
(Ægialitis) melodus 230
calidris 536
cinclus 231
dominicus 228
fulvus 229
fulvus var. virginicus 228
helveticus. 228
hiaticula. 230
himantopus 231
jamaicensis. 229
marmoratus 228
melodus. 230
mexicanus 231
okeni 230
pluvialis 228, 229
rubidus 236
semipalmatus 230
squatarola 228
torquatus 229
varius 228
virginicus 228
vociferus 229
Chaulelasmus 254
americana 254
streperus 425
Chauliodus strepera 254
Cheimonea tridactyla 267
Cheiroptera 145

Page.

- Chelidon bicolor 189
- Chelonia 289, 295, 296
  - agassizii 303
  - caouana 300
  - (caouana) cephalo 301
  - caretta 289, 300
  - (caretta) cephalo 301
  - caretta var. β 301
  - cephalo 301
  - coriacea 303
  - depressa 303
  - dussumierii 301
  - (Eretmochelys) imbricata 299
  - formosa 302
  - imbricata 299, 300
  - lachrymata 302
  - maculosa 302
  - marmorata 302
  - multiscutata 300
  - mydas 287, 289, 390, 301, 302
  - mydas var. 302
  - mydas var. marmorata 302
  - olivacea 301
  - pelasgorum 301
  - (sphargis) coriacea 303
  - tenuis 302
  - virgata 300, 302, 303
  - viridis 302
- Chen hyperboreus 252
- Chimney Swift 209
- Chionochen hyperborea 252
- Chloroceryle alcyon 210
- Chordeiles 208
  - virginianus 208
- Chrœcocephalus philadelphia 267
- Chroicocephalus atricilla 266
  - bonapartei 267
- Chrysomitris 195
  - macroptera 195
  - pinus 195
- Chrysopetalidæ 308
- Cinclus interpres 231
- Circus 217
  - cyaneus hudsonius 217
    - var. hudsonius 217
  - hudsonius 217
  - uliginosus 217
- Cirratulidæ 323
- Cirratulus 323
  - tenuis, new species 323
- Clamatores 205
- Clangula 258
  - albeola 259
- Clangula americana
  - clangula
  - glaucion 25
  - vulgaris
- Clutterbuck, Captain
  - W.
- Coccoborus ludovicianus
- Coccothraustes cardinalis
  - (Guiraca) ludoviciana
  - rubricollis
  - virginianus
- Coccothraustinæ
- Coccyginæ
- Coccygus americanus
  - dominicus
  - erythrophthalmus
- Coccyzus
  - americanus 21
  - bairdii
  - dominicus
  - erythrophthalmus
  - pyrrhopterus
- Colaptes
  - auratus
  - mexicanus
- Cole, Dr 193, 219, 224, 257, 2
- Colin, Virginian
- Collurio
  - ludovicianus
  - borealis
- Collyrio borealis
  - chemungensis
- Colpochelys kempii
- Columba canadensis
  - carolinensis
  - (Goura) passerina
  - marginata
  - migratoria
  - passerina
- Columbæ
- Columbella cribraria
  - mercatoria
- Columbidæ
- Columbinæ
- Colymbus auritus
  - caspicus
  - cornutus
  - duplicatus
  - ludovicianus
  - nigricans
  - obscurus
  - podiceps
- Common Mouse

Page.
ipe.................. 233
rn.................. 269
ale.................. 147
.... 288
.... 206
realis.................. 206
operi.................. 206
soleucus.................. 206
rens.................. 207
can.................. 250
stone, and its vari-
.... 9
acea.................. 303
Double-crested.................. 262
.... 248
.... 204
.... 204
.... 204
icanus.................. 204
.... 205
e.................. 204
sponsa.................. 256
.... 197
henslowi.................. 197
noveboracensis.................. 247
.... 189
ia.................. 189
.... 228, 257
.... 203
ird.................. 203
.... 274, 275
.... 248
maicensis.................. 248
wn.................. 176
.... 248
.... 247
.... 248
ca.................. 249
is.................. 248
a.................. 248
nerican Red.................. 193
hite-winged.................. 194
non American.................. 204
.... 298
leucoptera.................. 194
ck-billed.................. 211
low-billed.................. 212
.... 211
.... 211
ricanus.................. 212
atus.................. 213
olinensis.................. 212
erosus.................. 212
ninicensis.................. 212

Page.
Cuculus erythrophthalmus.................. 211
Curlew, Esquimaux.................. 241
Hudsonian.................. 240
Curvirostra americana.................. 193, 194
leucoptera.................. 194
Cyanoloxia cyanea.................. 199
Cyanopterus discors.................. 256
Cyanospiza.................. 199
cyanea.................. 199
Cygninæ.................. 251
Cygnus.................. 251
americanus.................. 251
bewickii.................. 251
canadensis.................. 252
ferus.................. 251
musicus.................. 251
Cymochorea leucorrhoa.................. 284
Cymotomus anglorum.................. 274
arcticus.................. 273
Cynanthus colubris.................. 209
Cyphoma gibbosa.................. 31
Cypræa ——.................. 32
Cypseli.................. 208
Cypselidæ.................. 209
Cypselus pelasgius.................. 209

D.

Dabchick.................. 278
Dædalion pictum.................. 218
Dafila.................. 254
acuta.................. 254
acuta var. americana.................. 254
caudacuta.................. 254
Dana, Prof. James D..................6, 8, 12, 17
Darrell, John.................. 209
John Harvey.................. 38, 44
Richard.................. 227
R. R.................. 68
Darwin, Charles..................6, 8, 17, 26, 27
De Candolle.................. 60
Dendrœca.................. 191
Dendroica.................. 180
æstiva.................. 180
cærulescens.................. 181
canadensis.................. 181
castanea.................. 182
coronata.................. 182
discolor.................. 183
maculosa.................. 183
palmarum.................. 183
pinus.................. 183
virens.................. 181
Dendronessa sponsa.................. 256

Page.

- Denison, Lieut. . 169, 170, 178, 181, 187, 189, 197, 205, 206, 225, 234, 238, 240, 243, 244, 246, 253, 254, 255, 257, 259, 263, 266, 270
- Dermatochelys coriacea 303
  - porcata 303
  - atlantica 303
- Dolichonyx 202
  - agripennis 202
  - oryzivorus 202
- Dominicanus marinus 265
- Double-crested Cormorant 262
- Dove, Carolina 225
  - ground 225
  - sea 278
- Dovekie 278
- Drummond, Colonel . 173, 184, 199, 217, 235, 262, 268
- Duck, Black 253
  - Canvas-back 258
  - Dusky 253
  - Hawk 219
  - Lesser Scaup 257
  - Ring-necked 258
  - Ruddy 260
  - Summer 256
  - Surf 283
  - Wood 256
- Dusky Duck 253
  - Shearwater 274
- Dyer, Prof. Thiselton 45
- Dysporus sula 261
- Dytes cornutus 277

E.

- Eagle, Bald 223
  - White-headed 223
- Eastern Bluebird 173
  - Red-tailed Buzzard 220
  - Snow-bird 198
- Ectopistes 224
  - carolinensis 225
  - marginata 225
  - migratoria 224
- Egret, great white 242
- Egretta candidissima 243
  - cœrulea 243
  - leuce 242
  - nivea 243
  - virescens 244
- Elliott, Governor 56, 58, 62, 63
- Emberiza cyanea 199
  - glacialis 195
  - graminea 197

Page.

- Emberiza henslowi 197
  - hyemalis 198
  - montana 195
  - mustelina 195
  - nivalis 195
  - oryzivora 202
  - pecoris 203
  - (Plectrophanes) nivalis 195
  - savanna 197
- Empidonax 207
  - pusillus 207
  - pusillus var. traillii. 207
  - traillii 207
- Enicocichla aurocapilla 184
  - noveboracensis 185
- Enoplobranchus 324
  - sanguineus 324
- Epëira 192
  - clavipes 192
- Eremonia elongata 301
- Eremophila alpestris 177
  - cornuta 177
- Eretmochelys 295
  - imbricata 287, 290, 299
  - squamata 300
- Eubalæna cisarctica 147
- Euchelys macropus 302
- Eumeces longirostris 287
- Eunice 315
  - denticulata, new species. 316
  - longicirrata, new species. 318
  - longisetis, new species... 317
  - mutilata, new species.... 315
  - Roussæi 319
  - violacea 319
- Eunicidæ 315
- European Goldfinch 196
  - House Sparrow 196
  - Skylark 178
  - Snipe 233
- Ereunetes 234
  - himantopus 234
  - occidentalis 234
  - petrificatus 234
  - pusillus 234
  - semipalmata 234
- Erismatura 260
  - rubida 260
- Erismaturinæ 260
- Ernst, Prof. 45
- Erythaca (Sialia) wilsoni 173
- Erythrophrys americanus 212
  - carolinensis 212
  - erythrophthalmus 211

Page.
Curlew 241
308
ıcrotricha 308

F.

ɔrdii 241
219
on) lithofalco 219
on) lithofalco var.
mbarius 219
n 219
naceus 222
ɔillus 218
is 220
ıensis 222
nsis 222
ɔarius 219
ınis 219
ıs 217
218
218
;us 222
ıius 217
triorchis) columba-
219
ixtus 219
ensis 220
s 221
ephalus 223
nus 220
ɔgenys 219
221
ps 219
lis 219
gus 223
ɔarius 218
lvanicus 218
nus 219
us 223
218
Johannis 221
us 217, 221
rius 220
rius 219
nculus) sparverius. 220
sus 217
218
gtonii 223
217
219
grine 219
311
tochona 311
tenant 216

Page.
Felivox carolinensis 172
Festing, Lieutenant 190, 234
Ficedula ludoviciana 179
marilandica 186
trichas 186
Finsch, Dr. O 277
Fissurella barbadensis 31
græca 31
Flamingo, American 250
Flicker 213
Florida cœrulea 243
Gallinule 248
Flycatcher, olive-sided 206
Traill's 207
Force, Peter 23
Fork-tailed gull 268
Fossils 31
Fox sparrow 198
Fozard, C 233
Fozard, C. B 256
Fozard, Mr 177, 232
Frigate Bird 263
Fringilla ambigua 203
borealis 195
cardinalis 200
cyanea 199
domestica 196
ferruginea 198
georgiana 198
graminea 197
henslowi 197
hudsonia 198
hyemalis 198
iliaca 198
linaria 195
ludoviciana 199
nivalis 198
palustris 198
pecoris 203
pinus 195
punicea 199
rufa 198
savanna 197
(Spiza) palustris 198
(Zonotrichia) iliaca 198
Fringillidæ 193
Fulica 250
americana 250
atra 250
flavirostris 249
martinica 249
martinicensis 249
noveboracensis 247
wilsoni 250

Page.

- Fulicinæ 246
- Fuligula 257
  - affinis 257
  - albeola 259
  - clangula 258
  - collaris 258
  - (Gymnura) rubida 260
  - marila 257
  - mariloides 257
  - minor 257
  - (Oxyura) rubida 260
  - perspicillata 259
  - rubida 260
  - rufitorques 258
  - vallisneria 258
- Fuligulinæ 257
- Fulix affinis 257
  - collaris 258

G.

- Gadwall 254
- Galeoscoptes carolinensis 172
- Gallinæ 226
- Gallinago 232
  - brehmi 233
  - brehmii 232
  - delamotti 233
  - drummondii 232
  - gallinaria, var. wilsoni 232
  - media 167, 233
  - sabini 233
  - scolopacina 233
  - uniclavata 233
  - wilsonii 232
- Gallinula 248
  - carolina 247
  - chloropus 248, 249
    - var. galeata 248
  - crex 248
  - galeata 248
  - martinica 249
  - noveboracensis 247
  - porphyrio 249
- Gallinule, Florida 248
  - Purple 249
- Gambetta 238
  - flavipes 238
  - melanoleuca 238
- Gannet, booby 261
- Garman, Samuel 285
- Garzetta candidissima 243
- Gates, Sir Thomas 22, 23, 150
- Gavia atricilla
  - bonapartei
  - leucoceps
  - sabini
  - tridactyla
  - bruchii
- Gavina zonorhyncha
- Gelochelidon agraria
  - anglica
  - aranea
  - balthica
  - meridionalis
  - palustris
- Geology of Bermuda
- Geopicus auratus
- Geothlypinæ
- Geothlypis
  - trichas
- Gibbs 184, 194, 211,
- Glaucion clangula
- Glaucus argentatoides
  - argentatus
  - zonorhynchus
- Glossy Ibis
- Glottis semipalmata
- Godet, Dr. T. L
- Godet, M. Theodore
- Godwit, hudsonian
- Golden-crowned Thrush
  - Eye
  - Robin
  - Winged Woodpecker
- Goldfinch, European
- Goniaphea
  - ludoviciana
- Goode, Prof. G. Brown 6, 288, 290 305
- Goosander
- Goose, Canada
  - Snow
- Goshawk, American
- Gosse, Mr
- Graculus
  - dilophus
- Grallatores
- Gray, Dr. Asa
- Gray Plover
- Great black-backed Gull
  - Blue Heron
  - Northern Shrike
  - White Egret
- Greater Shearwater
  - Yellow-shanks
- Grebe, Horned

Page.
e, Pied-billed ... 278
n Heron ... 244
  Turtle ... 287, 301, 302
  Wing-d Teal ... 255
nwood, Dr ... 60
  King-bird ... 206
  Snipe ... 233
bach ... 45, 62
beak, Cardinal ... 200
    Rose-breasted ... 199
ind Dove ... 225
aca ludoviciana ... 199
-billed Tern ... 268
, Bonaparte's ... 267
  Forked-tailed ... 268
  Great black-backed ... 265
  Herring ... 266
  Laughing ... 266
  Ring-billed ... 266
  Sabine's ... 268

H.

matopodidæ ... 230
liaëtus ... 223
    leucocephalus ... 223
    washingtonii ... 223
liplana fuliginosa ... 270
losydna ... 309
    leucohyba ... 309
dy, John ... 289
ford, Mr ... 203, 272
rier, American ... 217
vey, Capt ... 225
  Hon. E ... 71, 72, 73
  Samuel ... 227
res, George W ... 30
rk, American Sparrow ... 220
  Duck ... 219
  Hen ... 220
  Marsh ... 217
  Night ... 166, 208
  Pigeon ... 219
  Sharp-shinned ... 218
wkbill ... 299, 300
wksbill Turtle ... 287
y, Col. Drummond ... 151
dland, John ... 146
lymeles ludovicianus ... 199
linaia protonotarius ... 180
lix circumfirmata ... 31
  microdonta ... 31
lminthophaga citrœa ... 180
lmitherus protonotarius ... 180
lospiza palustris ... 198

Page.
Hemipalama himantopus ... 234
    minor ... 234
    multistriata ... 234
Hen-hawk ... 220
Henicocichla, aurocapilla ... 184
    noveboracensis ... 185
Henslow's Bunting ... 197
Hermodice ... 306
    carunculata ... 306
Herodias alba var. egretta ... 242
    candidissima ... 243
    cœrulea ... 243
    egretta ... 242
      var. Californica ... 242
    leuce ... 242
    virescens ... 244
Herodiones ... 241
Heron, American Night ... 244
  Great Blue ... 242
  Green ... 244
  Little Blue ... 243
  Snowy ... 243
  Yellow-crowned Night ... 245
Herring Gull ... 266
Herse bicolor ... 189
Hesione proctochona ... 311
Hesionidæ ... 311
Heteropoda mauri. ... 234
    semipalmata ... 234
Heyl, J. R ... 14
Hierofalco atricapillus ... 218
Himantopus ... 231
    melanopterus ... 231
    Mexicanus ... 231
    nigricollis ... 231
Hinson, Mr ... 231
Hirunda rufa ... 188
Hirundinidæ ... 188
Hirundininæ ... 188
Hirundo ... 188
    Americana ... 188
    bicolor ... 189
    cærulea ... 189
    cinerea ... 189
    horreorum ... 188
    ludoviciana ... 189
    pelagica ... 209
    pelasgia ... 209
    purpurea ... 189
    riparia ... 189
    rustica ... 188
    subis ... 189
    versicolor ... 189
    violacea ... 189

Page.
Laridæ 265
Larinæ 265
Lark, brown 177
  horned 177
  shore 177
Laroides argentaceus 266
    argentatoides 266
    argentatus 266
    argenteus 266
    major 266
    minor 268
    rissa 267
    tridactyla 267
Laropis anglica 268
Larus 265
  albus 265
  argentatoides 266
  argentatus 266
  argenteus 266
  atricilla 266
  bicolor 269
  bonapartei 267
  canus 266
  capistratus 267
  cinereus 266
  columbinus 269
  delawarensis 266
  fuscus 266
  gavia 267
  glaucus 266
  maculatus 265
  marinus 265, 266
    var. β 266
  maximus 265
  merulinus 271
  nævius 265, 267
  niger 265
  occidentalis 266
  philadelphia 267
  philadelphicus 267
  ridibundus 266
  riga 267
  rissa 267
  sabinii 268
  smithsonianus 266
  sterna 269
  torquatus 267
  tridactylus 267
  zonorhynchus 266
Lasiurus cinereus 145
Laughing Gull 266
La Warre 150
Leach's Petrel 284
Least Bittern 246

Page.
Least Sandpiper 235
Leather-Back Turtle 287
  Turtle 303
Lefroy, General 20, 26, 29, 293
  Governor 72, 99
  Sir J. H 6, 7, 19, 33, 46
Lepidochelys dussumierii 301
    olivacea 301
Leptopelicanus fuscus 262
Lepturus candidus 263
Lesser Scaup Duck 257
  Tell-tale 238
Lightbourn, Mr 89
Limestone, Coral 9
Limicolæ 228
Limosa 237
  ægocephala 237
  australis 237
  grisea 233
  hudsonica 237
  melanura 237
Linaria minor 195
  pinus 195
  savanna 197
Linnet, pine 195
  red-poll 195
Linota linaria 195
Little Auk 278
  Black Rail 248
  Blue Heron 243
  Yellow Rail 247
Livona pica 31
Lizards 287
Llewellyn 216
Lobipes 231
  hyperboreus 231
Loggerhead 300, 301
  Turtle 287
Longipennes 265
Lophodytes cucullatus 261
Loxia 193
  americana 193
  cardinalis 200
  curvirostra 193
    var. americana 193
  falcirostra 194
  leucoptera 194
  ludoviciana 199
  obscura 199
  rosea 199
Lucina pennsylvanica 31
Lumbriconereis opalina 321
    splendida 321
Lye, Captain 189

M.

Page.

Mabouia 288
Macrorhamphus 233
  griseus 233
  scolopaceus 233
Mallard 253
Mammals of Bermuda 143
Manning, Mr. F. A 37
Man-of-war Bird 263
Manx Shearwater 273, 277
Mareca 255
  americana 255
  penelope β 255
Marila affinis 257
  collaris 258
Marphysa 319
  acicularum, new species 319
Marsh Hawk 217
Martinico gallinule 249
Martin, purple 189
Martyr, Peter 292
Maryland yellow-throat 186
Maury, M. F 151
May, Henry 20, 21, 290
Megaceryle alcyon 210
Megalopterus stolidus 271
Melittarchus dominicensis 206
Mellisuga colubris 209
Melospiza 198
  fasciata 283
  palustris 198
Merganser castor
  var. Americanus 260
  cucullatus 261
  gulo 260
  raii 260
  serrator 261
Merganser, hooded 261
  red-breasted 261
Merginæ 260
Mergus 260
  americanus 260
  castor 260
  cristatus 261
  cucullatus 261
  leucomelas 261
  merganser 260
  niger 261
  serrator 261
Mergulus 278
  alle 278
  melanoleucus 278
Merriam, Clinton Hart 281

Merriam, Walter H.
Merula migratoria
  mustelina
  olivacea
  wilsoni
Metapoceros
Michaux, A.
  Francis Andre 4
Micropalama
  himantopus
Microptera americana
Middleton, Michael
Milvinæ
Miminæ
Mimus
  carolinensis
  felivox
M'Leod, Capt.
Mniotilta
  borealis
  canadensis
  castanea
  citrœa
  coronata
  discolor
  varia 16
  varia var. longirostris.
  virens
Moll, Herman
Molobrus pecoris
Molothrus
  ates
  pecoris
Monticola cyaneus
Moore, Governor
Moseley, H. R
Motacilla
  æstiva
  americana
  aurocapilla
  cærulescens
  canadensis
  citrœa
  coronata
  eques
  flavicauda
  ludoviciana
  maculosa
  mitrata
  noveboracensis
  œnanthe
  palmarum
  protonotarius
  sialis

Page.
tacilla varia 179
  virens 181
tacillidæ 177
use, common 161
nro, General 45, 89
ridæ 156
rray, John 29, 30
s alexandrinus 157
  americanus 157, 158
  decumanus 156
  flaviventris 157
  infuscatus 158
  musculus 161
  nigricans 157
  norvegicus 156
  rattus 157, 158
  setosus 158
  tectorum 157
scicapa animosa 205
  cantatrix 190
  carolinensis 172
  cooperi 206
  cucullata 186
  dominicensis 206
  guerula 207
  inornata 206
  noveboracensis 190
  olivacea 192
  rapax 207
  rex 205
  rubra 187
  ruticilla 186
  selbyi 186
  traillii 207
  tyrannus 205
  virens 207
yiarchus virens 207
yiobius borealis 206
  traillii 207
  virens 207
yioctonas mitratus 186
yiodioctes 186
  mitratus 186
ytilus exustus 31

N.

asea candei 32
  var. antillarum 32
ectris amaurosoma 273
  anglorum 274
  baroli 274
  cinerea 273
  fuliginosa 273

Page.
Nectris obscura 274
  puffinus 274
Nelson, General R. I. 5, 9, 11, 12, 13, 18, 25, 27, 31, 293, 294
Nereidæ 312
Nereis 312
  bairdii, new species 312
  gigantea 306
  gracilis, new species 313
Nerita peloronta 31
Nettion carolinensis 255
Newport, Capt 23
Newton, Prof 178
Nicidion 320
  kinbergi, new species 320
Night Hawk 166, 208
Niphcea hyemalis 198
Nisus columbanus 219
  fuscus 218
  pennsylvanicus 218
Noctua acadica 215
  nivea 216
  nyctea 216
Noddy Tern 271
Northern Phalarope 231
Norway Rat 156
Norwood, Richard 24, 147
Numenius 240
  borealis 240, 241
  brasiliensis 240
  brevirostris 241
  hudsonicus 240
  intermedius 240
  microrhynchus 241
  phæopus 240
  rufiventris 240
Nuthatch, red-bellied 176
Nyctala acadica 215
  albifrons 215
Nyctale 215
  acadica 215
Nyctea 216
  nivea 216
  scandiaca 216
    var. arctica 216
Nycteininæ 216
Nyctherodius violaceus 245
Nyctia candida 216
Nyctiardea 244
  gardeni 244
  grisea var. gardeni 244
    var. nævia 244
  nævea 244

Page.

- Nyctiardea violacea, 245
- Nycticorax americanus, 244
  - gardeni, 244
  - griseus, 244
  - nævia, 244
  - violaceus, 245
- Nyroca vallisneria, 258

O.

- Oakley, Col, 204
- Oceanites, 272
  - oceanica, 272
  - oceanicus, 272
  - wilsonia, 272
- Œdemia, 259
  - perspicillata, 259
- Œnone, 321
  - diphyllidia, 321
- Oïdemia perspicillata, 259
- Olive-backed Thrush, 171
- Olivella oryza, 32
- Oliver, Prof, 44, 55, 56
- Olive-sided Flycatcher, 206
- Olor americanus, 251
- On a Bird new to Bermuda, 281, 283
- Onocrotalus fuscus, 262
- Onychochelys kraussii, 300
- Onychoprion fuliginosa, 270
- Ophelia, 322
  - bicornis, 322
- Opheliidæ, 322
- Ophelina, 322
  - maculata, new species, 322
- Orde, Capt, 233, 262
- Oriole, Baltimore, 203
- Oriolus baltimore, 203
- Orpheus carolinensis, 172
  - felivox, 172
- Ortyginæ, 226
- Ortygometra carolina, 247
  - chilensis, 248
  - jamaicensis, 248
  - noveboracensis, 247
- Ortyx, 226
  - borealis, 226
  - castaneus, 226
  - virginianus, 226
- Osborn, Henry L, 32
- Oscines, 170
- Osprey, 222
- Otocorys, 177
  - alpestris, 177
    - var. chrysolæma, 177
- Otocorys alpestris var. leucolæma
  - cornuta
- Otus
  - americanus
  - brachyotus
  - galapagoensis
  - palustris
  - ulula
  - vulgaris
    - americanus
    - var. wilsonianus, 21
  - wilsonianus
- Oviedo, Gonzalo Ferdinando de
- Owl, American Hawk
  - Long-eared
  - Barred
  - Saw-whet
  - Short-eared
  - Snowy
- Oxyechus vociferus

P.

- Pandion
  - americanus
  - carolinensis
  - fluvialis
  - haliaëtus
  - haliætus, var. carolinensis
    - var. leucocephalus
  - indicus
  - leucocephalus
- Paridæ
- Partridge, Virginian
- Parula
  - americana, 1
- Parus americanus
- Passenger pigeon
- Passer
  - domesticus
  - linaria
- Passerculus
  - alaudinus
  - palustris
  - savanna
- Passerella
  - iliaca
  - obscura
- Passerellinæ
- Passeres
- Passerina cyanea
  - oryzivora

Page.
na pecoris 203
George 43
r, Mr 56
al Sandpiper 235
culus 31
idæ 262
us 262
  aquilus 263
  (Carbo) dilophus 262
  fiber 261
  fuscus 262
  sula 261
, Brown 262
brissoni 234
  maritima 236
  melanotos 236
  pectoralis 235
  pusilla 235
  schinzii 236
tta perspicillata 259, 283
  surinamensis 271
co 274, 275
n, W. S 59, 284
terus aura 224
læ 226
borealis 226
hudsonica 247
marilandica 226
virginiana 226
e Falcon 219
a carolinensis 225
a carolinensis 225
  migratoria 224
V. B 44
Leach's 284
Wilson's 272
elidon bicolor 189
Wood 207
.... 263
  æthereus 263
  candidus 263
  flavirostris 263
  rubricauda 263
idæ 263
s 168
ocoracidæ 262
ocorax dilophus 262
  floridanus 262
pe, Northern 231
podidæ 231
pus cinerascens 231
  cinereus 231
  fuscus 231
  hyperboreus 231

Page.
Phalaropus ruficollis 231
Phileremos alpestris 177
  cornutus 177
Philohela 232
  minor 232
Phœnicopteridæ 250
Phœnicopterus 250
  ruber 250
Phœnicosoma rubra 187
Phœnisoma rubra 187
Physalia 295
Physeteridæ 153
Physeter macrocephalus 153
Physical geography of Bermuda. 6
Piaya americana 212
  dominica 212
  erythrophthalma 211
Picariæ 208
Pici 212
Picidæ 212, 213
Picinæ 212
Picus atrothorax 212
  auratus 213
  (Dendrocopus) varius 212
  (Sphyrapicus) varius 212
  varius 212
Pied-billed Grebe 278
Pigeon Hawk 219
Pigeon, Passenger 224
Pilumnus varius 212
Pimlico 275
Pine-creeping Warbler 183
Linnet 195
Pintail 254
Piping Plover 230
Pipit, American 177
Pitylus cardinalis 200
Plants, Botanical names of 133
  English names of 127
Plectrophanes 195
  nivalis 195
Pleione caruncalata 306
Plestiodon longirostris 287
Plover, American golden 166, 228
  Black-bellied 228
  Gray 228
  Kildeer 229
  Piping 230
  Ring 230
  Semipalmated 230
Pluvialis fulvus americanus 228
  varius 228
  virginicus 228
Podarke 311

Page.
- Podarke obscura 311
- Podiceps 277
  - arcticus 277
  - carolinensis 278
  - caspicus 277
  - cornutus 277
  - ludovicianus 278
  - obscurus 277
  - sclavus 277
- Podicipidae 277
- Podilymbus 278
  - lineatus 278
  - podiceps 278
- Pœcilonis sparverius 220
- Pœcilopternis borealis 220
- Polynoë leucohyba 309, 310
- Polynoidæ 309
- Poocætes 197
  - gramineus 197
- Pooecetes gramineus 197
- Pooley, Mr 217
- Porphyrio americanus 249
  - cyanicollis 249
  - martinica 249
  - tavona 249
- Porphyrula 249
  - martinica 249
- Porzana 247
  - carolina 247
  - jamaicensis 248
  - noveboracensis 247
- Potamilla 325
- Prairie warbler 183
- Procellaria anglorum 273
  - fuliginosa 273
  - grisea 273
  - major 273
  - obscura 274
  - oceanica 272
  - pelagica 272
  - puffinus 273
  - tristis 273
  - wilsoni 272
  - yelkouan 273
  - yelkuan 274
- Procellariadæ 274
- Procellariidæ 272
- Procellariinæ 272
- Progne 189
  - purpurea 189
  - subis 189
- Prothonotary Warbler 180
- Protonotaria citrœa 180
- Protulides, new genus 325
- Protulides elegans, new species
- Pterocyanea discors
- Puffinus
  - amaurosoma
  - anglorum 273, 27
  - arcticus
  - barolli
  - cinereus
  - fuliginosus
  - griseus
  - l'herminieri
  - major
  - obscurus 273, 274, 27
  - opisthomelas
  - tristis
  - yelcuanus
  - yelkouan
- Purple gallinule
  - Martin
  - Sandpiper
- Pusey, Dr
- Pygopodes
- Pyranga
  - æstiva
  - erythromelas
  - rubra 18
- Pyrgita domestica
- Pyrocephalus (Contopus) borealis
  - virens

Q.

- Quail, Virginian
- Quassi, Mr.
- Querquedula
  - acuta
  - carolinensis
  - caudacuta
  - crecca
  - discors
  - strepera

R.

- Rail, Carolina
  - Land
  - Little black
  - Little yellow
  - sora 16
  - Virginian
- Rallidæ
- Rallinæ
- Rallus
  - aquaticus var. β
  - carolinus
  - crex

Page.
Crex) carolinus 247
amaicensus 248
imicola 246
oveboracensis 247
uficollis 247
tolidus 247
irginianus 246
ster prasinus 209
s 213
ck 157
wn 156
rway 156
e 157
rostra himantopus 231
rostridæ 231
ied nuthatch 176
l 200
Summer 187
asted Merganser 261
    Snipe 233
    Thrush 170
d vireo 192
Linnet 195
ks 270
, American 186
pt. Savile G 163
vernor 45, 53, 54, 58, 68
r W 73
S 117
37, 45, 48, 62, 68, 69, 112
of Bermuda 285, 287
phus pinus 183
    castaneus 182
    virens 181
yphus aura 224
ora mangle 283
hilus 239
    chlorophygius 239
    solitarius 239
spis clypeata 256
d 202
hale 147, 151
led Gull 266
ked Duck 258
ver 230
267
nnichii 268
erea 268
tzebui 268
dactyla 267
n, Dr 36
merican 170
olden 203
156

Page.
Rollo, Capt 103
Rooke, Capt 166, 187, 234, 255
Roseate Tern 269
Rose-breasted Grosbeak 199
Ruby-throated Humming-bird 209
Ruddy Duck 260
Rusticola (Microptera) minor 232
    minor 232

S.

Sabella 327
    melanostigma 327
Sabellidæ 325
Sabine's Gull 268
Sanderling 236
Sandpiper, Bartram's 240
    Bonaparte's 235
    Least 235
    pectoral 235
    Purple 236
    Semipalmated 234
    Solitary 239
    Spotted 239
    Stilt 234
    White-rumped 235
Sargent, Prof 45, 78
Sauria 287, 289
Savanna Sparrow 197
Saw-whet Owl 215
Saxby, Dr 194
Saxicola 173
    œnanthe 173
    œnanthoides 173
    sialis 173
Saxicolidæ 173
Sayornis borealis 206
Scarlet Tanager 187, 283
Scincus fasciatus 289
    ocellatus 289
Scolopacidæ 232
Scolopacinæ 232
Scolopax alba 237
    borealis 240, 241
    candida 237
    delicatula 232
    douglasii 232
    drummondii 232
    flavipes 238
    gallinago 232, 233
    grisea 233
    hudsonica 237
    lapponica 237
    (Macrorhamphus) grisea 233

Page.

- Scolopax melanoleuca, 238
  - minor, 232
  - noveboracensis, 233
  - semipalmata, 237
  - vociferus, 238
  - wilsonii, 232
- Scops albifrons, 215
- Scoresby, 150
- Scorpions, 288
- Scoter, Skunk-Head, 283
  - Surf, 259
- Scotophilus acadicus, 215
  - noctivagans, 145
- Sea-Dove, 278
- Sea Turtles (Chelonioidea), with synonymy, 290
- Seiurus, 184, 185
  - aquaticus, 185
  - aurocapillus, 184
  - gossii, 185
  - ludovicianus, 185
  - noveboracensis, 168, 185
  - tenuirostris, 185
- Semipalmated Plover, 230
  - Sandpiper, 234
- Serpula dianthus, 327
- Serpulidæ, 327
- Setophaga, 186
  - mitrata, 186
  - ruticilla, 186
- Setophaginæ, 186
- Sharp-Shinned Hawk, 218
- Shearwater, Black-vented, 276, 277
  - Dusky, 274
  - Greater, 273
  - Manx, 273, 277
  - Sooty, 273
- Shore Lark, 177
- Short-eared Owl, 214
- Shoveller, 256
- Shrike, Great Northern, 193
- Sialia, 173
  - sialis, 173
  - wilsoni, 173
- Silver-Haired Bat, 145
- Sitta, 176
  - canadensis, 176
  - stulta, 176
  - varia, 176
- Sittinæ, 176
- Skink, 288
- Skunk-Head Scoter, 283
- Skylark, European, 178
- Slippery Backs, 288
- Small-Billed Water-Thrush
- Smith, Capt. John, 22, 88, 15
  - Hodgson
- Snipe
  - American, 16
  - Common
  - European
  - Grey
  - Jack
  - Red-Breasted
  - Wilson's
  - Wood
- Snow-Bird, Eastern
- Snow Bunting
  - Goose
- Snowy Heron
  - Owl
- Solitary Sandpiper
- Somers, Sir George
- Song Sparrow
- Sooty Shearwater
  - Tern
- Sora Rail, 1
- Sorex
- Soricidæ
- Sparrow, European House
  - Fox
  - Savanna
  - Song
  - Swamp
- Sparvius atricapillus
  - lineatus
- Spathulea clypeata
- Spatula
  - clypeata
- Spenser, Archdeacon
- Spermaceti Whale
- Sperm Whale
- Sphargididæ
- Sphargis, 2
  - coriacea, 287, 290, 2
  - coriacea var. schlegelii
  - mercurialis
  - schlegelii
- Sphyrapicus
  - varius
- Sphyropicus varius
- Spiza cyanea
- Spizellinæ
- Spizinæ
- Spoffoth, Colonel
- Spotted Sandpiper
- Squatarola
  - australis

Page.

atarola helvetica 228
fford, Richard 148
ganopodes 261
rna 268
- affinis 268
- anglica 268
- aranea 268
- cæsia 271
- dougalli 269
- douglasi 269
- fissipes 271
- fluviatilis 269, 271
- fuliginosa 270
  - var. crissalis .. 270
- gouldii 270
- gracilis 269
- guttata 270
- (Haliplana) fuliginosa ... 270
- hirundo 269
- luctuosa 270
- macdougalli 269
- macrodactyla 269
- macroptera 269
- macrotarsa 268
- nævia 271
- nigra 271
- (Onychoprion) fuliginosa. 270
- paradisea 269
- philadelphia 267
- pileata 271
- plumbea 271
- senegalensis 269
- serrata 270
- stolida 271
- surinamensis 271
- wilsonii 269

ninæ 268
t, Black-Necked 231
t Sandpiper 234
t, American 235
ne, Mr 251
we, Captain 73
achy, William 22, 150, 289, 291
epsilas 230
- collaris 231
- interpres 230

igiceps hudsonius 217
- uliginosus 217

igidæ 213
iginæ 213
rix acadica 215
- acadiensis 215
- accipitrina 214
- albifrons 214

Page.

Strix (Asio) otus 213
- brachyotus 214
- brachyura 214
- bubo 216
  - var. albus 216
- canadensis 217
- candida 216
- caspia 214
- chichictli 215
- erminea 216
- fernandica 215
- froti hudsonis 217
- funerea 217
- hudsonia 217
- nebulosa 215
- nivea 216
- nyctea 216
- otus 213
- palustris 214
- peregrinator 213
- phalænoides 215
- scandiaca 216
- varius 215

Struthus hyemalis 198
Sula 261
- brasiliensis 261
- fiber 261
- fusca 261

Sulidæ 261
Summer Duck 256
- Red-Bird 187

Summers, Sir George 291
Summer Warbler 180
Surf Duck 283
- Scoter 259

Surnia 217
- hudsonia 217
- nyctea 216
- ulula 217
  - var. hudsonia 217

Swainson, John 272
Swallow, Bank 189
- Barn 188
- White Bellied 189

Swamp Sparrow 198
Swan, American 251
- Whistling 251

Swift, Chimney 209
Sylbeocyclus carolinensis 278
- podiceps 278

Sylvania mitrata 186
- ruticilla 186

Sylvia æstiva 180
- americana 179

Page.
Sylvia anthoides 185
aurocapilla 184
autumnalis 182
cærulescens 181
canadensis 181
carolinensis 180
castanea 182
childreni 181
citrinella 181
coronata 182
discolor 183
flava 181
leucoptera 181
maculosa 183
magnolia 183
marilandica 186
minuta 183
mitrata 186
noveboracensis 185
palmarum 183
petchia 183
pinus 183
protonotarius 180
pusilla 179, 181
rathbonia 181
roscoe 186
sialis 173
sphagnosa 181
torquata 179
trichas 186
varia 179
vigorsii 183
virens 181
xanthopygia 182
Sylviacola coronota 182
Sylvicola æstiva 180
americana 179
canadensis 181
castanea 182
discolor 183
maculosa 183
mitrata 186
petechia 183
pinus 183
pusilla 179
ruficapilla 183
varia 179
virens 181
Sylvicolidæ 179, 191
Sylvicolinæ 179
Symphemia 237
atlantica 237
semipalmata 237
Syrninæ 215

Page.
Syrnia nyctea 216
Syrnium 215
nebulosum 215

T.

Tachycineta bicolor 189
Tachypetes 263
aquilus 263
Tachypetidæ 263
Tadorna nivea 252
Tallents, Lieutenant 200, 216, 219, 255, 259
Tanager, Scarlet 187, 283
Tanagra æstiva 187
cyanea 199
rubra 187
Tanagridæ 187
Tanagrinæ 187
Tantalidæ 241
Tantalus loculator 251
mexicanus 241
Tattler 238
Teal 166
Blue-winged 256
Green-winged 255
Tectarius muricatus 31
Tell-Tale, Lesser 238
Terebella 324
carunculata 306
magnifica, new species 324
Terebellidæ 324
Tern, Black 271
Common 269
Gull-billed 268
Noddy 271
Roseate 269
Sooty 270
Testudinata 287
Testudo caonana 300
caretta 300
cephalo 300
coriacea 303
coriacea s. mercurii 303
imbricata 299, 300
japonica 301
macropus 302
mydas 301, 302
tuberculata 303
viridis 302
Tetrao marilandicus 226
virginianus 226
Thalasseus anglicus 268
Thalassidroma anglorum 373
oceanica 272
wilsoni 272

Page.
infuscata 270
caouana 287, 290, 300
(Colpochelys)
kempii 301
corticata 301
kempii 301
(Lepidochelys)
olivacea 301
olivacea 301
[illegible] 323
Sir Wyville. 5, 8, 12, 25, 26, 27, 28, 29
olden-crowned 184
live-backed 171
ed-breasted 170
mall-billed Water 185
Wood 171
lus 220
columbarius 219
sparverius 220
, Captain 182, 203, 263, 271, 278
um 237
s bartramius 240
(Catoptrophorus) semipalmatus 237
chilensis 238
chloropus 239
var. solitarius. 239
choloropygius 239
crassirostris 237
flavipes 238
fuscocapillus 238
glareola 239
macroptera 239
macularius. 239
maritimus 236
melanoleucus 238
natator 238
noveboracensis 233
sasashew 238
semipalmatus 237
solitarius 168, 239
variegatus 240
vociferus 238
efortia................... 192
s Fly-catcher 207
Rat 157
as marilandica 186
personatus 186
roscoe 186
a.......................... 235
(Actodromas) maculata.. 235
arenaria 236
(Arquatella) maritima... 236

Page.
Tringa bartramia 240
bonapartii 236
canadensis 236
cinclus 235
dominicensis 235
dorsalis 236
(Euliga) bartramia 240
fusca 231
fuscicollis 235
helvetica 228
(Hemipalama) auduboni. 234
(Hemipalama) himantopus 234
(Hemipalama) semipalmata 234
(Heteropoda) semipalmata 234
hiaticula 230
himantopus 234
hyperborea 231
interpres 230
littoralis 236
lobata 231
longicauda 240
macularia 239
maculata 235
maritima 236
melanotus 236
minutilla 235
morinella 231
nana 235
nigricans 236
notata 239
ochropus 239
pectoralis 235
pusilla 234, 235
schinzii 235
semipalmata 234
solitaria 239
squatarola 228
striata 236
undata 236
varia 228
wilsoni 235
Tringites macularius........... 239
Tringoides 239
bartramius 240
macularius 239
Tristram, Canon 180
Rev. H. B 232, 242
Trivia rotunda 32
Trochilidæ 209
Trochilus 209
aureigaster 209

Page.
Trochilus colubris............166, 167, 209
Trompe Whale.................. 153
Trott, J. H.................... 224
Truncatella.................... 31
Trunk Turtle.................. 303
Trynga arquatella.............. 236
  tridactyla.............. 237
Tucker, Daniel..................146, 153
  Governor.............. 158
  Harry.............. 216
Tupper, Captain.............. 202
Turdidæ.................... 170
Turdinæ.................... 170
Turdus.................... 170
  aquaticus.............. 185
  aurocapillus.............. 184
  canadensis.............. 170
  carolinensis.............. 172
  coronatus.............. 184
  densus.............. 171
  felivox.............. 172
  lividus.............. 172
  melodus.............. 171
  migratorius.............. 170
  minimus.............. 171
  minor.............. 171
  mustelinus.............. 171
  olivaceus.............. 171
  (Seiurus) noveboracensis. 185
  solitarius.............. 171
  swainsoni.............. 171
  trichas.............. 186
Turkey-buzzard.............. 224
Turner, Mrs. Hildebrand.......... 105
  Sir Hildebrand.......... 103
Turnstone.................... 230
Turtle, Green................287, 301, 302
  Hawksbill.............. 287
  Kemp's Gulf.............. 301
  Leather.............. 303
  Leather-back.............. 287
  Loggerhead.............. 287
  Trunk.............. 303
Turtles.................... 287
  Sea, List of, with synonymy.............. 299
Tyrannidæ.................... 205
Tyranninæ.................... 205
Tyrannula cooperi.............. 206
  trailli.............. 207
  virens.............. 207
Tyrannus.................... 205
  borealis.............. 206
  carolinensis.............. 205

Tyrannus cooperi..................
  dominicensis..............
  griseus..............
  intrepidus..............
  leucogaster..............
  pipiri..............
  traillii..............
  vieillotii..............
  virens..............
  matutinus..............

U.

Ulula acadica..................
  brachyotus..............
  nebulosa..............
Uria alle..................

V.

Vanellus helveticus..............
  melanogaster..............
  squatarola..............
Vaughan, Daniel..............
Vermetus lumbricalis..............
Vermivora protonotarius..............
Vespertilionidæ..............
Viralva anglica..............
  nigra..............
Vireo.................... 19
  belli..............
  bogotensis..............
  gilvus..............
  musicus..............
  noveboracensis..............
  olivaceus..............
  Red-eyed..............
  vigorsii..............
  virescens..............
  White-eyed..............
Vireonidæ..................
Vireoninæ..................
Vireosylvia..................
  olivacea..............
Virginian Colin..............
  Partridge..............
  Quail..............
  Rail..............
Vultur aura..................
  aura β..............
  iota..............

W.

Walther, A. F..................
Warbler, Black and Yellow..........
  Black Creeping..........
  Blue Yellow-backed...

Page.
Warbler, Fly-catching Hooded .. 186
  Pine Creeping 183
  Prairie 183
  Prothonotary 180
  Summer 180
  White Creeping 179
  Yellow Blue-eyed 180
  Yellow-rump 182
Water-witch 278
Webster, Prof. H. E 305
Wedderburn, Colonel 168, 171, 173, 174, 177, 178, 183, 185, 188, 193, 194, 197, 202, 204, 206, 209, 213, 216, 218, 224, 228, 229, 230, 233, 234, 235, 236, 238, 242, 243, 246, 248, 252, 257, 261, 262, 263, 264, 266, 267, 268, 270, 272, 278
Vetheby, Captain 44
Vhale, Cape 147
  Common 147
  Right 147, 151
  Sperm 153
  Spermaceti 153
  Trompe 153
heatear 173
histling Swan 251
hite-bellied Swallow 189
hite Creeping Warbler 179
hite-eyed Vireo 190
hite-headed Eagle 223
hite-rumped Sandpiper 235
hite-winged Crossbill 194
igeon, American 255
illet 237
illiams, Daniel 296
ilmot 146
ilson 188
ilsonia mitrata 186

Page.
Wilson's Petrel 272
  Snipe 232
Wingood, Mr 67
Woodcock, American 232
Wood Duck 256
Woodpecker, Golden-winged 213
  Yellow-bellied 212
Wood Pe-Wee 207
  Snipe 241
  Thrush 171

X.

Xema 268
  atricilla 266
  bonapartei 267
  sabinii 268
Xiphias gladius 150

Y.

Yarrell 173
Yellow-bellied Woodpecker 212
Yellow-billed Cuckoo 212
  Tropic Bird 263
Yellow-crowned Night Heron ... 245
Yellow-rump Warbler 182
Yellow-shanks 166, 238
Yellow-shanks, Greater 238
Yellow-throat, Maryland 186
Yphantes baltimore 203

Z.

Zenaidinæ 225
Zenaidura 225
  carolinensis 225
  marginellus 225
Zonites bermudensis 31
  var. nelsonii 31
Zonotrichia alaudina 197
  graminea 197
Zostera marina 296

Department of the Interior:

U. S. NATIONAL MUSEUM.

STANFORD JUNIOR UNIVERSITY
DEC 23 1891
LIBRARY

BULLETIN

OF THE

NITED STATES NATIONAL MUSEUM.

No. 26.

AUNA COLUMBIANA: BEING A LIST OF BIRDS ASCERTAINED TO INHABIT THE DISTRICT OF COLUMBIA, WITH THE TIMES OF ARRIVAL AND DEPARTURE OF SUCH AS ARE NON-RESIDENTS, AND BRIEF NOTICES OF HABITS, ETC.

THE SECOND EDITION,

REVISED TO DATE, AND ENTIRELY REWRITTEN.

BY

ELLIOTT COUES, M. D., Ph. D.,

Professor of Anatomy in the National Medical College, etc.,

AND

D. WEBSTER PRENTISS, A. M., M. D.,

rofessor of Materia Medica and Therapeutics in the National Medical College, etc.

◆

WASHINGTON:
GOVERNMENT PRINTING OFFICE
1883.

Department of the Interior:
U. S. NATIONAL MUSEUM.

—32—

BULLETIN

OF THE

UNITED STATES NATIONAL MUSEUM.

No. 26.

PUBLISHED UNDER THE DIRECTION OF THE SMITHSONIAN INSTITUTION.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1883.

ADVERTISEMENT.

This work is the thirty-second of a series of papers intended to illustrate the collections of natural history and ethnology belonging to the United States, and constituting the National Museum, of which the Smithsonian Institution was placed in charge by the act of Congress of August 10, 1846.

It has been prepared at the request of the Institution, and printed by authority of the honorable Secretary of the Interior.

SPENCER F. BAIRD,
Secretary of the Smithsonian Institution.

SMITHSONIAN INSTITUTION,
Washington, June 1st, 1883.

Rail shooting on the Anacostia Marshes
Washington. D.C. (page 18)

AVIFAUNA COLUMBIANA:

BEING A

LIST OF BIRDS

ASCERTAINED TO INHABIT THE

DISTRICT OF COLUMBIA,

WITH THE TIMES OF ARRIVAL AND DEPARTURE
OF SUCH AS ARE NON-RESIDENTS, AND
BRIEF NOTICES OF HABITS, ETC.

THE SECOND EDITION,
REVISED TO DATE, AND ENTIRELY REWRITTEN.

BY

ELLIOTT COUES, M. D., Ph. D.,
Professor of Anatomy in the National Medical College, etc.,

AND

D. WEBSTER PRENTISS, A. M., M. D.,
Professor of Materia Medica and Therapeutics in the National Medical College, etc.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1883.

CONTENTS.

	Page.
I.—**Literature** of the Subject	7
II.—**Location** and Topography of the District	11
III.—**General** Character of the Avifauna	28
IV.—**Annotated** List of the Birds	33
V.—**Summary** and Recapitulation	111
VI.—**Game** Laws of the District	119

AVIFAUNA COLUMBIANA:

BEING

A LIST OF BIRDS ASCERTAINED TO INHABIT THE DISTRICT OF COLUMBIA, WITH THE TIMES OF ARRIVAL AND DEPARTURE OF SUCH AS ARE NON-RESIDENTS, AND BRIEF NOTICES OF HABITS, ETC.

THE SECOND EDITION, REVISED TO DATE AND ENTIRELY REWRITTEN.

BY

ELLIOTT COUES, M. D., Ph. D.,

Professor of Anatomy in the National Medical College, etc.,

AND

D. WEBSTER PRENTISS, A. M., M. D.

Professor of Materia Medica and Therapeutics in the National Medical College, etc.

I.—LITERATURE OF THE SUBJECT.

The authors of the "Avifauna Columbiana," while classmates in college at the Columbian University and still mere boys, became enthusiastic on the subject of Ornithology, as boys often do. They were constantly together, devoting all their spare time, which might not have been better employed, to the practical study of birds in the woods and fields. Large collections were made; careful and copious notes were taken of times of appearance and disappearance of birds, their relative abundance, resorts, food, song, nidification, and other habits. These observations became in a few years of some positive value.

This was chiefly during the years 1858–1862, both inclusive. Soon after the outbreak of the War of the Rebellion, both authors, having meanwhile graduated in medicine, entered the Army as medical officers. One of them soon afterward settled in the practice of his profession in Washington; the other led for many years the vagabond life of an Army surgeon; and the exigencies of their respective avocations long prevented each from paying any further attention to the subject which had brightened their college days and cemented a life-long friendship.

Meanwhile, however, at the suggestion and through the kind attentions of Professor Baird, their early experiences in Ornithology resulted in a "List of the Birds of the District of Columbia," etc., which was published in 1862 in the Annual Report of the Smithsonian Institution for 1861, pp. 399–421. After the lapse of nearly a quarter of a century they may be permitted to refer to that production with some little pride, as to one which has stood the test of time better than boys' work generally does. The original "List" was necessarily brief, owing to the fact that the limitations imposed by law upon the size of the volume in which it was printed prevented any extended presentation of their observations. They had on hand, or in head, material which, had circumstances been entirely favorable, it would have been well to publish, but which is little likely to be recovered now that time has softened the outlines of original observations, and wrought what were fresh and vivid pictures into the shadowy shapes of far-away pleasant perspective.

In preparing the present article as one of a series in which, following the lead of Prof. Lester F. Ward's admirable Flora, it is proposed to set forth the Fauna of the District, the authors have in effect simply made a second edition of their "List," as stated in the title. There has been found little to correct, because the original "List" contained scarcely anything erroneous; and not much to add, of the authors' own knowledge, because they have paid little attention to the subject during the intervening years. They have, however, entirely recast the article; embodied the additions to the list made meanwhile by others; extended their remarks on the habits of birds in many cases; included a more elaborate notice of the Topography of the District with reference to the local distribution of the birds; and added the Game Laws now in force in the District. They have also noted, as far as their knowledge enabled them to do so, the changes in the Avifauna resulting from the growth of a great city. Twenty or twenty-five years ago, with a population of about 0,000, the National Capital was a mud-puddle in winter, a dust-heap in summer, a cow-pen and pig-sty all the year round; there was good snipe-shooting within the city limits, and the country all about was as primitive as the most enthusiastic naturalist could desire. But with the assistance of Mr. Alexander Shepherd, who ought to have a statue, we have changed all that; Washington has grown up to 180,000, and become "citified" into quite a respectable establishment; the suburban wilderness has been reclaimed from Nature and largely given over to Art; while Ornithology has long been more assiduously and successfully pursued within than without the walls of the Smithsonian Institution. Besides all this, we have the Sparrows now.

The original "List" represented probably the first attempt at any formal enumeration of the Birds of the District of Columbia—perhaps the first local Fauna. At any rate, no earlier thing of the kind has come to our knowledge. A little book entitled "Washington Described," which had been published just previously by Philp & Solomons, contained cursory notices of the natural history of the District, prepared anonymously by several of the resident naturalists; and among these was a slight sketch of the Ornithology by one of the present writers.

much more cultivated, by members of the old Bo-

preceded the Potomac-side Naturalists' Club; the t of their labors forming the groundwork of Ward's Flora, already ioned. As a matter of fact, the present authors had little to go upon nd the records of a very few rare specimens which had been taken time to time and were preserved in the Smithsonian collection; gh Mr. C. Drexler was then the taxidermist of the Institution, and igent and successful collector, whose results were within their ; while the markets occasionally afforded him and them specimens might not otherwise have been noted.

e "List" presented a summary of 44 permanent residents; 44 winsidents; 59 summer residents; 54 regular visitants, or migrants er summering nor wintering with us; and 25 accidental visitants, ragglers, making a total of 226. There were also indicated 15 babilities," not, however, enumerated.

reviewing the subject, the authors find that only one species *iceps cristatus*, inserted by mistake) is to be eliminated. This leaves of 225 species as the basis of the present article. Before noticing cessions to the list since 1862, however, the authors should refer r. Jouy's Catalogue of 1877.

ough there have been meanwhile various detached notices of Wash-n Birds in the Bulletin of the Nuttall Ornithological Club and here, by the present and other authors, Mr. Jouy's is the only com-list which has since appeared. This was published in May, 1877, l. ii, No. 11, of "Field and Forest,"† pp. 191-193, entitled: "Cata-of the Birds of the District of Columbia." It was immediately nted, together with some remarks we offered on the same occa-in a few separate copies entitled: "Catalogue of the Birds of the ict of Columbia, Prepared by Pierre Louis Jouy, with Remarks on irds of the District, by Drs. Coues and Prentiss." (1877. 8vo. ington. pp. 1-11.) This was simply a list of names, without an-ion; the stragglers indicated by an asterisk, the additions to the oues and Prentiss List printed in italics. Mr. Jouy subtracted 1 es (*Parus atricapillus*—wrongly, as now appears), and added 15, ly:

1. *Geothlypis philadelphia.**
2. *Vireo noveboracensis.*
3. *Passer domesticus.*
4. *Loxia americana.**
5. *Loxia leucoptera.**
6. *Quiscalus purpureus æneus.*

---

onthly periodical conducted through two volumes by Mr. Charles R. Dodge. ostensibly and virtually the organ of the Potomac-side Naturalists' Club, which alvanized into some sort of re-existence after having been long defunct. But organization this Club was anachronistic, and, therefore, unable to survive. sent flourishing Biological Society has in one sense been evolved from the old ; but is more properly to be considered in the light of a special creation of the than an evolution from what preceded.

7. *Tyrannus verticalis.*
8. *[illegible] pratincola.*
9. *Ægialitis semipalmatus.**
10. *Gallinula galeata.*
11. *Spatula clypeata.*
12. *[illegible]*
13. *Bernicla brenta.*
14. *Sterna forsteri.**
15. *Oceanites oceanicus.*

These 15 accessions raised the total from the 226 of the Coues and Prentiss List to 240, Mr. Jouy having discarded one (*Sterna [illegible]*).

Of these 15, the 3 marked with the asterisk were indicated by us in 1862 as of probable occurrence.

We have to announce the following 8 accessions, making a total of 23 additions:

1. *Thryothorus bewicki.*
2. *Lanius ludovicianus.*
3. *Chondestes grammicus.*
4. *Ammodromus caudacutus.*
5. *Falco peregrinus.*
6. *Archibuteo lagopus sancti-johannis.*
7. *Macrorhamphus griseus.*
8. *Rallus longirostris crepitans.*

A single species is to be subtracted (*Podiceps cristatus*), leaving—

Tenable species of 1862	225
Added in 1877	15
Added in 1883	8
Total	248

II.—LOCATION AND TOPOGRAPHY OF THE DISTRICT OF COLUMBIA.

The District of Columbia lies just below the 39th parallel of latitude, and on the Washington meridian of longitude. It is on the Potomac River, 100 miles from its mouth, at the head of tide-water, and is between the States of Maryland and Virginia.

Formerly it was 10 miles square, occupying a portion of both States, on either side of the Potomac River, thus making an area of 100 square miles.

Of this area 64 square miles were in Maryland and 36 in Virginia, including the city of Alexandria. In 1846, by act of Congress, the Virginia portion of the District was retroceded to that State, so that there remains since that date only that portion within the limits of Maryland, containing 64 square miles of territory.

Although the area of this territory is comparatively small, it presents a sufficient variety of scenery to attract almost every species of bird incident to the latitude and longitude.

For convenience of description we will divide the District of Columbia into three regions, namely: 1. The Potomac River region; 2. The Anacostia River region; and, 3. Rock Creek region.

1. *THE POTOMAC RIVER REGION.*

The Potomac River coming down from the northwest makes a long sweeping curve towards the east from the "Little Falls," passing around Georgetown and Washington to the Arsenal Point, a distance of eight miles, when it again makes a sharp turn to the south, passing Alexandria.

The tide reaches to the foot of the "Little Falls," just within the District line to the northwest. Here the river is confined in a narrow gorge scarcely 100 feet across—a swift running torrent—bounded on the southwest (Virginia side) by high, precipitous, rocky cliffs, and on the northeast by a rocky river-bottom half a mile wide, reaching to the cliffs on the Maryland side, which correspond in height with, but are not so rugged as, those of the Virginia side. Along the base of the northern cliffs runs the Chesapeake and Ohio Canal.

This river-bottom extends along the river toward the city for about a mile and a half below the Little Falls, gradually becoming narrower until it terminates at Edes's Mill.

When the river is high this space is flooded, and in times of great freshets the whole river-bed is converted into a raging, roaring torrent. In the great freshet of November 26, 1877, the water rose until it entered the canal, and was within 15 feet of the floor of the Chain Bridge, which is 80 feet above the bed of the stream, and 47 feet above mean low-water mark. During the freshet of February 12, 1881, the water reached at its highest flood the top of the fifth course of stone, about 12 feet below the floor of the bridge.*

This bridge spans the river from cliff to cliff, and is an elegant iron structure, built upon strong buttresses of stone. It derives its name from the fact that the old, original bridge was suspended on chains.

When the river subsides after a flood, pools of water are left standing here and there over the surface of the low land, around which have grown up several species of swamp willow, together with grasses and shrubby bushes. In these pools are abundance of small fishes, which furnish food for King-fishers and Green Herons. In this locality many species of birds are found, chief among which may be mentioned the Woodcock (*Philohela minor*), the Spotted Sandpiper (*Tringoïdes macularius*), the King-fisher (*Ceryle alcyon*), Green Heron (*Butorides virescens*), and the Maryland Yellow-throat (*Geothlypis trichas*); while on the cliffs of the Maryland side large colonies of Cliff Swallows (*Petrochelidon lunifrons*) and Rough-winged Swallows (*Stelgidopteryx serripennis*) breed. In this locality also the Blue Grosbeak (*Guiraca cærulea*) has been found breeding.

At the head of the Little Falls, about half a mile above Chain Bridge, a dam has been constructed as a feeder to the canal. This creates an extensive lake of smooth water, extending from High Island, at the head of the rapids, up the river for a mile and a half, and has an average width of half a mile. Here are found during the winter season many species of Ducks, and in the summer the beautiful Wood Duck (*Aix sponsa*) breeds in the neighboring forests. Over its surface during the summer are continually skimming the various species of Swallows. At the upper end of this broad expanse of water are found the beautiful timbered islets appropriately named, by Prof. Lester F. Ward,† Box Elder, Sugar Maple, and Larkspur Islands, where many of the timid wood-birds breed in undisturbed retirement.

"High Island" lies at the junction of the feeder-dam and the feeder (of the canal), which latter converts it into an island. It is a huge, towering rock, covering several acres.

Professor Ward eulogizes this locality, botanically, by the remark that the flora of High Island "is by far the most exuberant of all within the knowledge of botanists." We regret that the same cannot be said of fauna. As far as birds are concerned, it is decidedly common place, only a few of the summer residents breeding there, and many localities found more profitable during the spring and fall migration.

The cliffs on both sides of the river extend from the Little Falls to the Aqueduct Bridge, at Georgetown. On the Maryland side they are somewhat rolling, and in many places are cultivated. Above the Chain Bridge the hillside is wooded, while along the base, between the canal and the hill, there are low, swampy places, grown over with small trees, briars, and tangled undergrowth, in which Woodcock can always be found at the right season. Between the Chain Bridge and the first lock of the canal is a large stone quarry, worked in the face of the cliff, near the top of which a colony of Rough-winged Swallows have their home. Along those portions of the cliffs remaining wooded a few of the wood-birds still may be seen, but the rapidly increasing population is driving them out.

---

* This 's kindly furnished by Col. A. F. Rockwell, U. S. A., officer in charge ngs and grounds.

† of the District of Columbia, Bull. 22, U. S. Nat. Mus., 1881,

The cliffs upon the Virginia shore are quite different from those just considered, in being rugged, very precipitous, heavily wooded, and abounding in tangled undergrowth. A number of beautiful miniature glens exist, formed by spring branches and storm water, cutting their way through the rocks to the river. The face of the cliff has a northern exposure, and hence is more deeply shaded than the hills on the opposite side.

The locality is a favored one for breeding of the Worm-eating Warbler (*Helmintherus vermivorus*), Oven Bird (*Siurus auricapillus*), Wood Thrush (*Turdus mustelinus*), and the Woodcock (*Philohela minor*). Here also may be found much more abundantly than for comfort the copperhead snake (*Ancistrodon contortrix*), as many startled picnic parties can testify.

Coming back down the Potomac, the river continues narrow from the foot of the Little Falls to Edes's Mill, where it widens out considerably and continues to increase in width until the Aqueduct Bridge is reached, where it is half a mile wide.

This portion of the river, about four and a half miles long, although of no special interest ornithologically, is remarkable for the large numbers of fish which are captured in the spring of the year when they run up the river to breed. Many fishermen make a living during the months of May and June by catching shad (*Alosa sapidissima*) and herring (*Pomolobus vernalis, P. æstivalis*) with dip-nets in the deep, rapid current, fishing from the rocks or standing in the stern of a boat fastened to the shore. Great numbers of white perch (*Morone americana*) are also taken by anglers, who line the shore during this season.

The Potomac River widens out rapidly from Edes's Mill, one and a half miles below the Little Falls, where it is 100 yards, to the Aqueduct Bridge, where it is half a mile in width. This presents a beautiful sheet of quiet water, so thoroughly utilized by the boat clubs and rowing parties that few water-birds have opportunity to alight.

Along the shores the only birds seen are an occasional Spotted Sandpiper, King-fisher, or Swamp Sparrow.

The Aqueduct Bridge (so called because of carrying the Alexandria Canal across the Potomac at this point) crosses the river at the upper end of Georgetown. At its southern extremity is the little village [illegible]. Just below the bridge is Analostan Island, which lies op[illegible] the shipping wharves of Georgetown for nearly their whole ex[illegible] about half a mile. The island has a width of about 300 yards, an[illegible] now used as summer resort and picnic ground. It is separated fr[illegible] the Virginia shore by what is called "Little River," but which was [illegible] merly the main channel of the Potomac. Some thirty-five or forty yea[illegible] ago a causeway was built across this channel to the Virginia sh[illegible] thus cutting off the flow of water in this direction and forcing the cu[illegible] rent around in front of Georgetown. This little dam joining Analos[illegible] Island to the main-land proved, in the history of subsequent events, t[illegible] have been a cause of very great mischief to the Washington river fro[illegible]. It was and is a great advantage to the shipping interest of Georgetow[illegible] by forcing the main channel down in front of the wharves. In an orni[illegible] thological sense, it is of interest as having been instrumental—in con[illegible] nection with the causeway in the middle of the river at the "Lo[illegible] Bridge"—in developing immense tide-water marshes of wild rice (Zizani[illegible] aquatica).

The Long Bridge is one mile and a quarter long and crosses the riv[illegible] in front of the city of Washington at the foot of Fourteenth street. Be[illegible]tween the Washington and Virginia channels of the river the bridge consists of half a mile of earth causeway, impeding to this extent the current of the river. The distance between the lower end of Analostan Island and the Long Bridge is about one mile and a half, the river widening from half a mile to a mile and a quarter. When the main current of the river swept through the channel behind Analostan Island it was deflected at its lower end towards the east, and a large proportion of the water was carried across to the Washington side, making a channel along the entire Washington front of sufficient depth for vessels of light draft. (See map of Potomac River region.)

A glance at the map will show the effect of closing this channel and diverting the current to the north side above the island. When it reaches the lower end of the island the entire current enters the Virginia channel, and the Washington channel is as effectually barred as though dammed. Immediately the spaces marked by the dotted lines began to fill up from alluvial deposits, and now they are marshes of wild rice, marsh grass, [illegible], etc., which afford feeding grounds for vast numbers of Reed-birds (*Dolichonyx oryzivorus*), Rail (*Porzana carolina* and *Rallus virginianus*), Blackbirds (*Agelæus phœniceus*), Marsh Wrens (*Cistothorus palustris*), etc.

We have referred more in detail to the formation of these marshes than we otherwise would because they have another and more important significance than the ornithological one—one which, although not connec[illegible] with the subject of this paper, still is of sufficient [illegible] deserve a passing notice. We refer to the increased [illegible] rial diseases in the adjacent portion of Washington [illegible] these marshes. The subject has also an indirect interest from an ornithological point of view, for in a few years, perhaps at the time this sketch is being read, these marshes will all be reclaimed and their present *locus* occupied by a beautiful park diversified by picturesque lakelets, bridges, and groves of ornamental trees; and the places which now afford feeding grounds to myriads of marsh birds, already mentioned, will know them no more forever.

The first steps towards reclaiming the "Potomac Flats" have already been taken in Congress (1882), and before many years the whole area between Easby's wharf and Greenleaf's Point and the present north river shore, embracing an area of about 1,000 acres, will have been added to the city limits of Washington. This is a consummation the more devoutly to be wished for, for another reason than danger from "malaria," one which we have not heretofore seen urged, namely, the danger from "yellow fever." The yellow-fever germ is not indigenous to this locality, but that we are not exempt from the liability to the disease in the summer season is evidenced by the ravages which it has occasioned in past years in the cities of Norfolk, Portsmouth, Philadelphia, and New York. There is reason to believe that the germ of contagion of this disease is not perfected in the human body, but requires certain conditions outside the body for its development into the virulent form which works such deadly consequences to the human race. These conditions are found best fulfilled in maritime ports during the hot season, where the tide ebbs and flows, alternately exposing accumulated sewer-filth to the rays of a summer sun, and again flooding it, twice each twenty-four hours. This is exactly the state of things with the "Potomac Flats." Sewer deposits are caught by the vegetation of the marshes, stirred up constantly by the tides, and for a portion of each day exposed to the sun and air. What the result might be were the yellow-fever germs once to get a fair start in so favorite a soil is terrible to contemplate.

Coming back to our birds from this digression, we observe that this portion of the river, lying between Analostan Island and Greenleaf's Point and extending southward from Greenleaf's Point towards Alexandria, furnishes feeding-waters to large numbers of Ducks, which may be found especially abundant in the months of February and March, just previous to their spring migration. At this period many are shot for the market by gunners, and sportsmen can have fair sport on occasions in shooting from floats located above or below Long Bridge.

Roche's Inlet and the "Four-Mile Run" are favorite feeding-places, where a judiciously placed "blind" and decoys will afford at times good shooting. Four-Mile Run is situated on the Virginia side of the river, about half way between Long Bridge and Alexandria. The Alexandria Canal crosses it at the point where it empties into the river, which it does through two culverts under the canal, through which the tide pours in a strong current during its ebb and flow. Behind the canal embankment, the run expands into quite a large marsh of reeds, wild rice, and marsh grass, which gives refuge to Summer Duck, Teal, Rail, etc., while

"Jackson City."

Gravelly Run receives an
entire length constitute a s
trees. It is a favorite resort
Duck, Green Heron, Wilson'
marsh birds, Rail, Reed-bird
also are found several "Wo
to such as enjoy the steam ba
the close and tangled recesse

2. *EASTERN BRANCH*

At the mouth of the Eastern
Point, on which the United Sta
side is Giesboro; the distance b

From the mouth to the Anac
a half, the narrow and tortuou
bank, passing in front of the Wa
of the river bed consists of "flats"
sufficiently shallow to give root t
is gradually filling up, and the tim
we shall have an extensive tide-wa
Above the Anacostia Bridge to the
tomac), a distance of three-fourths o
is the same. This portion of the An

The extent of these tide-water marshes has very greatly increased during the past twenty years (since the former paper was published), and they are steadily encroaching upon the channel. Fifty years ago there was sufficient depth of water in the Anacostia River to float ocean-going vessels up to Bladensburg, the head of tide-water, six miles above its confluence with the Potomac. Since that period the stream has been gradually filling up, until now it is navigable only to sand scows.

The marshes have an average width of one-third of a mile, and are about three miles long. Benning's Bridge crosses the Anacostia River about two miles above the Navy-Yard Bridge and three miles below Bladensburg, and is the headquarters for marsh shooting. Here skiffs can always be hired, and, if notice be given, pushers also can be obtained.

The marshes are intersected at intervals by streams called by the euphonious name of "guts," which are from 3 to 6 feet in depth, and 10 to 20 feet wide. The larger of these are the continuations of rivulets which empty into the river, and by them the tide overflows and ebbs from the marshes. Along the edges of the river and of the "guts," never entirely uncovered at low tide, grow the lily-pads (*Nuphar advena*) and wanquapins (*Nelumbium luteum*). In these marshes the Long-billed Marsh Wren (*Telmatodytes palustris*) breeds abundantly.

Emptying into the river just below Benning's Bridge, on the west side, is a large branch known as "Turtle Gut." It is the outlet of a small stream coming in at what are known as "Mayhew's Meadows," a grass marsh on the west side, a short distance below the bridge. This meadow is a well-known feeding ground for the Jack Snipe (*Gallinago wilsoni*) in the spring of the year.

Twenty years ago the outlet of Turtle Run expanded into a broad, shallow bay, with Mayhew's Meadows on the west and a wild-rice marsh on the east. In this bay grew patches of wild rice, wanquapins, and lily-pads, and it was a favorite resort for ducks. At this date, however (1882), this space has been entirely converted into a wild-rice marsh, and "Turtle Gut" is nearly obliterated.

Above Benning's Bridge about a quarter of a mile the river marsh widens out into a bay on the east side. Here we find another large gut, known as Succabel's Gut, also a favorite resort for Ducks. On the shore at this point is an excellent "Woodcock brake." On the west side of the river the marshes, intersected by numerous guts, extend unbroken for one and a half miles to a bold bluff, which reaches down to the water's edge at a point near the Reform School.

Opposite this bluff, a little up stream, comes in Piney Run, quite a large, winding gut; and half a mile still farther up the Beaver Dam Run empties. At Beaver Dam is situated a good wild-rice marsh, known as McCormick's Marsh, while between this and Piney Run Gut the marsh is grown up with buttonwoods and alders, making good cover and feeding ground for Woodcock and King Rail (*Rallus elegans*).

On shore, along the edge of Beaver Dam Run, at McCormick's, is a widest part, above. It is pointed at both ends, each end being covered over for about 2 feet. At the stern this affords a seat to the paddler, while at the bow it forms a locker for the reception of the game. The one seat is about the junction of the anterior and middle third of the length. The hull is constructed of three planks, one for the bottom and one each for the sides. The side planks are cut upon a pattern, so that when put together the bottom curves upwards towards each end very much after the manner of the ocean fisherman's dory. The advantage of this shape becomes immediately apparent when upon the marsh; the skiff is thus enabled to ride over the reeds and grass instead of plunging into the tangled masses.

Within a year or two, skiffs have been introduced made of galvanized iron instead of wood. They have the advantage of being lighter, and also of being perfectly smooth, thereby causing less friction in passing through the reeds. The metallic skiff is always ready to be put into the water, being unaffected by exposure to the sun and air, whereas a wooden boat that has been out of the water for several days will always leak when first used subsequently. Wooden boats get water-logged and become heavier, while the metal ones are unchanged, and they last a long time. The cost of such a galvanized iron skiff as is here described is about $25.

We give a drawing of one belonging to William Wagner, of Washington, D. C., said to be the "best skiff on the marsh."

It is of galvanized iron, strengthened by iron ribs (knees), with a bead-like flange of the same material all around the side at the top. It has water-tight compartments at both ends, which would float it in case of an upset. It weighs about 100 pounds and costs about $25. The following are the measurements:

	Feet.	Inches.
Length over all	16	0
Width over all, widest part	3	0
Width on bottom, widest part	2	1
Depth at ends	0	11½
Depth at middle	0	10
From bow to seat	6	3
Width of seat	1	0

Air-tight compartments at each end 23 inches long.

These skiffs, although very "precarious" to the uninitiated, are quite seaworthy in the hands of a skillful boatman, and are used also on the river for duck-shooting.

In getting into one of these little crafts for the first time the sensation is one of insecurity, and the feeling is well expressed by the phrase in common use, that "You must part your hair in the middle" to avoid an upset.

The sportsman gets in first and sits upon the middle seat, with his s and ammunition in front of him. He should have two guns and

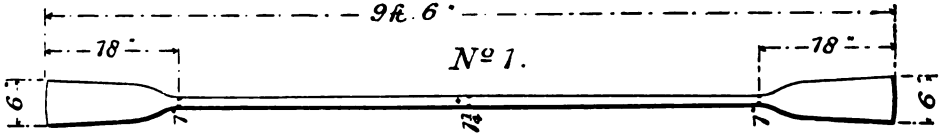
EXPLANATION OF PLATE.

Galvanized-iron hunting skiff, property of William Wagner, Washington, D. C.[*]

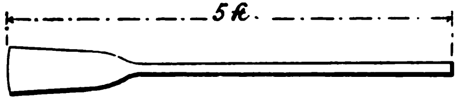
No. 1.—Double paddle.
No. 2.—Single paddle.
No. 3.—"Creeping" paddle for use entirely under water in creeping on ducks.
No. 4.—"Pushing pole" for propelling the boat over the marsh in rail shooting.
No. 5.—Profile view of skiff, showing the degree of "sheer" at each end.
No. 6.—Bird's-eye view of skiff.
For further particulars see page 20.

---

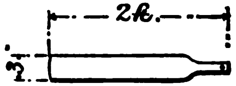
[*] The authors are indebted to Mr. Geo. H. Miller, of Washington, D. C., for the drawings and dimensions given in this plate.



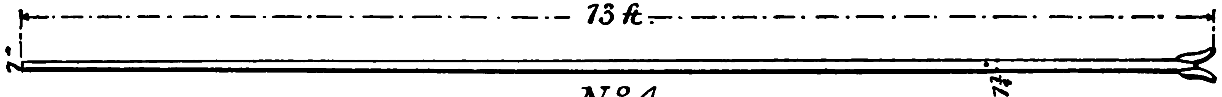
Nº 1.



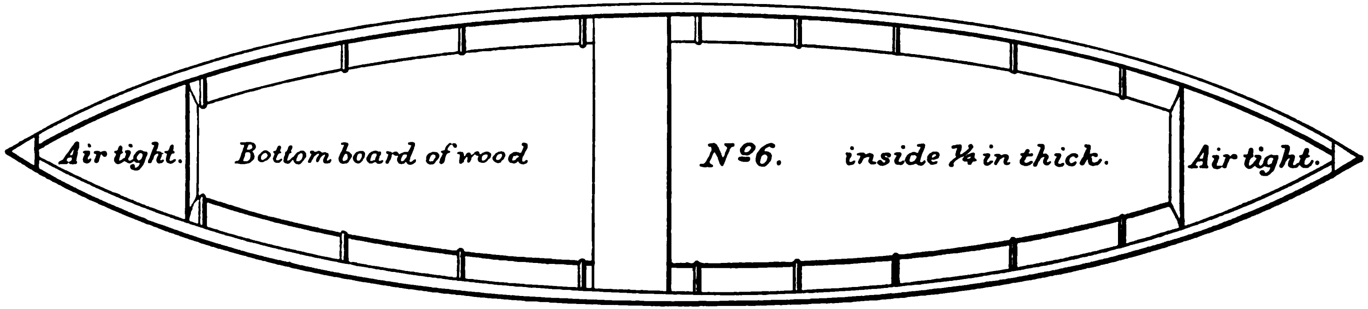
Nº 2.

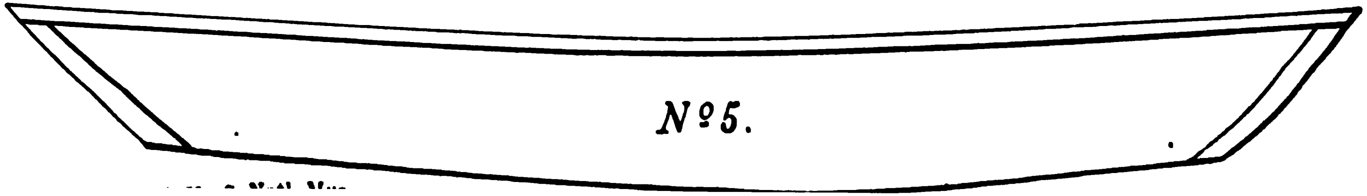


Nº 3.



Nº 4.





Nº 5.

not less than 300 loaded shells; two guns, to change when one becomes too hot to handle. Shells should be loaded with 2 drachms of powder and three-quarters of an ounce of No. 10 shot. Some use 2½ drachms of powder and one ounce No. 10 shot.

Having taken his position, the pusher shoves off and paddles over the channel to the marsh opposite. Entering the marsh both must stand, the sportsman in front, his left foot forward and right foot behind the seat, steadying himself as best he can. He soon becomes accustomed to the motion of the boat, which, if the pusher be a good one, is moderately steady, being propelled along at the rate of about 2 miles an hour. If propelled too slowly, the birds will run out of the way without flushing, and if too fast, they will dive and wait for the boat to pass. The pusher propels the skiff by means of a pole 16 feet in length, with a crotch at the distal end to prevent it from sinking in the mud.

By skillful use the boat is kept moving almost at a uniform rate, except where very thick masses of tangled reed are met, when all the strength and skill is taxed in getting through, and the sportsman must take care that he is not by a sudden lurch precipitated overboard.

On the marsh the little craft is much steadier than in open water, because supported by the undergrowth, and a tumble overboard results only in a disagreeable wetting, the water being but 2 or 3 feet deep.

The time of day for entering the marsh varies with the tide. The water is usually deep enough one hour and a half before the flood tide, and the shooting continues one and a half hours after, making about three hours' shooting for an average tide. The highest tides occur when the wind has been from the east or southeast for twenty-four hours and when the moon is in conjunction with the sun.

When the birds have not been much disturbed they will be found feeding all over the marsh; and as the centers are more easily accessible to the boat these are first gone over, and as many birds secured as possible. This drives them to such shelter as they can find in thick patches of tall reeds and tangled saw-grass and wanquapins usually found along the edges of the river and of the guts. These covers must then be beaten as the tide begins to fall. The boat is run along the edges and the reeds beaten with a pole, by which means many birds are frightened into taking flight and secured.

So they go, gliding through the marsh, and the birds begin to rise. Now both the pusher and shooter have all they can attend to. Birds rise in front, to the right, to the left, behind; the greenhorn becomes excited, confused; doesn't know which to shoot at; fires almost at random; misses oftener than he hits; swears at his gun, at his shells, at the unfortunate pusher, at everything but himself, who alone is at fault, and not unlikely tumbles overboard. If he is of the right mettle, however, he soon settles down to work, deliberately picks his bird each time, and then there is but little more missing.

Sometimes birds will get up behind him and out of the range of his

he old pines are found the Pine Creeping Warbler (*Den-*

nning's Bridge, on the east side, the hills become broken, hat point to Bladensburg we have a rolling, varied country, he variety of cultivated fields, wooded hill-sides, interesting mpses, small marshes, etc.

r Dam Creek, about three-fourths of a mile east of McCor- wet meadow—a favorite feeding-ground of Wilson's Snipe in —while adjacent is a dense marshy thicket, affording refuge for many Woodcock.

Dam Creek is named from the fact that a beaver dam for- ted along its course, and its remains may still be seen. This also of interest to the anthropologist on account of the many the aboriginal tribes found in the vicinity.

estern bank of the Anacostia River is of less interest than the From its mouth to the District almshouse, a distance of two it is within the city limits, and more or less thickly built up. ty almshouse is immediately on the bank of the Anacostia River, the beginning of the zizania marshes, and adjoining it on the s the Congressional Cemetery. North of the almshouse is May- Meadow, already mentioned as a favorite feeding-ground of Wil- nipe. From this point to the District line, near Bladensburg, the cter of the country is varied between hillside and meadow and ated fields, and presents nothing of special interest.

3. *ROCK CREEK REGION.*

he Rock Creek region embraces the valley of Rock Creek from the nt of its confluence with the Potomac River to the District line, a stance of five miles. Rock Creek is a small stream having a direc- on from north to south. It has a rapid current, and contains suffi- ient water to furnish good water-power to mills even at the driest eason; while it is subject to sudden rises during storms, when it be- comes a turbulent torrent. The stream has cut its way through the rocky hills which surround Washington on the north, producing many locali- ties of picturesque scenery. In fact, the natural beauty of the scenery for the entire length of the creek, from the city limit to the District line, is seldom surpassed, and the selection of this region for a public park would be a most appropriate one, and we heartily join in the recom- mendation of Professor Ward to that end.*

---

* In the Guide to the Flora of Washington and its Vicinity, Bulletin No. 22, 1881, U. S. National Museum, Professor Ward says: "The character of the surface along Rock Creek is most beautiful and picturesque, often rocky and hilly, with frequent deep ravines coming down into the usually narrow bottom through which it flows. The stream itself is full of most charming curves, and the whole region is an

For the entire distance the stream is bordered by high hi times so precipitous as to afford precarious footing, sometime back gently, almost always well wooded, and in many places a tangled undergrowth of laurel (*Kalmia latifolia*), which p beautiful appearance when in flower in the spring-time.

The sides of the valley are intersected at many points b produced by the small streams flowing into the creek along i These ravines, amounting in many cases to beautifully shad add variety to the scenery, and afford favored retreats to mai of retiring wood-birds. In several places are stretches of l found between the banks of the stream and the wooded hills stituting fertile meadows. In fact, such is the beauty and the scenery, that this region is the favorite collecting groun ornithologist for all species of birds except the water-birds a inhabiting the open fields. Upon the hill-tops we have high op in the ravines, cool shaded glens, with light undergrowth; also dense tangled undergrowth of laurel, and in other localit swamps and brier patches. The character of the woods al from oak, hickory, maple, etc., to pine groves and cedar patcl ing attractions to a great variety of birds.

In referring more in detail to the Rock Creek region, we fi repeating much of the excellent description given by Prof.] Ward in his Flora of the District of Columbia.

For convenience of description he divides this region into six which, for the sake of uniformity, we shall follow.

The portion of the creek between its confluence with the and the city boundary line on the north is not included in Ward's description. This portion was the dividing line bet corporations of Washington and Georgetown before they wer into one. It is spanned by four bridges—at K street, at Pen avenue, at M street, and at P street, the latter being at the extremity of the city limits. The southern portion of this pa creek is deepened by a dam at its outlet to the river, whereby verted into a canal as a continuation of the Chesapeake and Ol which empties into Rock Creek just below the Pennsylvani bridge. This portion of the creek being within the city limits nothing of interest to the ornithologist except that at the benc the P street bridge there is a row of willow trees in which in t may usually be found the Black-capped Flycatcher (*Myiodioctes*

---

park. No one can see it without thinking how admirably it is adapted for park. Such a park might be made to extend from Oak Hill Cemetery to tl Road opposite Brightwood, having a width of a mile to a mile and a half. every botanist, but every lover of art and nature must sigh at the prospe distant, of beholding this region devastated by the ax and the plow. Tl of Washington should speedly unite and strenuously urge upon Congress tance of early rescuing this ready-made national park from such an u *fate*."

At this point also is an old-fashioned "rope-walk" where as boys, twenty years ago, we obtained the raw flax which we used in mounting specimens.

This brings us to the first section of Professor Ward's division of the Rock Creek region, which extends from the P street bridge to Woodley Park.

The creek here makes a long curve. Following the stream against the current, we first go almost directly west, turning at the dam of Lyon's Mill to the north and northeast. On the north bank, just above the P street bridge, is "Kalorama," rendered historical in past years as the residence of Commodore Decatur, and used during the War of the Rebellion as the "Small Pox General Hospital." The surrounding hills are wooded with old forest trees. On the south bank, covering a steep, rocky ascent, is the beautiful and picturesque Oak Hill Cemetery. On the bank of the creek is Lyon's Mill, a short distance above which is the dam. The woods upon both sides are favorite resorts of the Wood Warblers, but collecting is forbidden. Along the shores of the creek are found Sandpipers, Marsh Sparrows, and Maryland Yellow Throats, while on the waters of the dam an occasional Duck or Dipper may be seen in the early morning.

Professor Ward's second division, the Woodley Park, extends from above Lyon's mill-dam to "Adams' Mill," now used as a tannery, a distance of about one mile. It presents extensive woods on both sides of the creek which are excellent collecting grounds. Upon the west side below the Woodley road bridge is a damp ravine in which one or two Woodcock may usually be found in the proper season.

Above the bridge, upon the west side, is perhaps the best collecting ground during the early spring in the District for Yellow-breasted Chats, Indigo Birds, Thrushes, Carolina Wrens, Worm-eating Warblers, and, a little later, of all the Wood Warblers. Here were taken in the spring of 1882 the Golden-winged Warbler (*Helminthophila chrysoptera*), Blue-winged Yellow Warbler (*H. pinus*), and the Cape May Warbler (*Dendrœca tigrina*). The scenery varies from high, open woods to low young trees with dense undergrowth, rocky hillsides, and cool, shaded ravines.

The third section extends from "Adams' Mill" to the confluence of "Piney Branch" with Rock Creek, again a distance of about a mile, following the windings of the stream.

At the lower portion on the east bank is a stone quarry, to which a road leads down from the city. Above this quarry on the same side, for a distance of half a mile, is another excellent collecting ground for the spring migration. There are high, open woods, swampy hollows, cool dells, thickets, and brier patches—all that make life attractive to the retiring Wood Warblers. Here, in a little patch of pines, in May, 1882, in company with Mr. H. W. Henshaw, we collected some twenty Blackburnian Warblers (*Dendrœca blackburnæ*), besides scores of other rare specimens.

On the opposite side of the stream the land is low and rolling, giving a scattered growth of small pines, and cedars, where the Prairie Warbler (*Dendrœca discolor*) may be found without fail.

"Piney Branch" comes down between the hills from the northeast, and is wooded clear down to its rocky bed, presenting in many places a thick undergrowth. Along its course the collector may rely in the spring upon finding both species of Water Thrush (Large-billed, *Siurus motacilla*, and Small-billed, *Siurus nævius*).

The fourth section extends from Piney Branch to the mouth of Broad Branch, a little over one mile.

Although this portion apparently should be as favorable to the presence of birds as some others, presenting very similar surroundings, our experience has been discouraging; but few birds have usually been observed. This may, however, be explained by the fact that it is a favorite resort of numerous picnic parties.

Following the road up "Broad Branch"—which joins the creek half a mile above Pierce's Mill—we find some of the most beautiful scenery in the limits of the District. The stream has worn for itself a rocky bed along the base of the steep hills which rise to a height of 200 feet above it on the north, while upon the south side they slope back more gently. The scenery is as wild as though untouched by the hand of man, with the exception of the road, and it is hard to realize that one is within three miles of a city of 180,000 inhabitants.

Professor Ward's fifth section is from the Broad Branch to the Military Road. He says it is "perhaps the most interesting section of Rock Creek. On the left bank lie the once noted Crystal Springs, and though the buildings are removed, the springs remain unchanged. . . . On the right bank and above Blagden's Mill is a bold bluff in a short bend of the creek, forming a sort of promontory upon which there grows the *Gaultheria procumbens*, the wintergreen or checkerberry, this being its only known locality within our limits."*

The sides of the stream are very rugged in places, with broken rocky walls, especially just opposite Blagden's Mill, where is the "Pulpit Rock," a flat-topped columnar rock which stands out over the creek at a height of 80 or 100 feet.

The sixth and last section, extending to the District line, presents nothing of special interest to the ornithologist.

We have thus, in describing in detail the three regions, namely, the Potomac River, the Anacostia River, and the Rock Creek, considered the portions of the District most interesting from the ornithologist's point of view.

---

* We would state that formerly the wintergreen could be found on the top of the hill on the east side of Rock Creek just below the stone quarry mentioned in speaking of the "second section." It grew under the laurel, but as we have not visited the locality for several years we cannot say if it is still to be found there.

ınd which lies between these portions presents the usual charac- of a farming country. The land is rolling, moderately thickly and offers all the variety of cultivated fields, meadows, forests, ımps which one would expect to find.

birds may be found that are not usually seen in the three sec- scribed, such as the Yellow-winged Sparrow (*Coturniculus passe-* Bay-winged Bunting (*Pooecetes gramineus*), which are abundant ultivated grass-fields, and the Black-bellied Plover (*Squatarola*), found in upland meadows and old cow-pastures.

of the localities which we found to be good collecting grounds years ago have so entirely changed their character that but few rds can be seen in their old haunts. Thus "Hawes' Woods," ead of Ninth street, just north of the city, was a favorite resort e Wood Warblers. These woods have been cut down, and their now occupied by scattering houses. The old "Park Woods" ıts on the level north of the city, between Fourth and Seventh but a portion of it is occupied as a beer garden, and another gives place to the Freedmen's Hospital, while all around are -houses.

are quite a number, however, which are extremely rare, and by no means entitled to be considered as inhabitants of the District. Such may be divided into three classes: First, those which visit us in severe winters, being driven beyond their usual range by inclemency of the weather or scarcity of food; such as *Nyctea nivea*, *Astur atricapillus*, *Falco peregrinus*, *Lanius borealis*, *Pinicola enucleator*, *Loxia americana*, *L. leucoptera*, *Ægiothus linarias*, *Plectrophanes nivalis*. Second, those which visit us in the latter part of summer, mostly the wandering young of species breeding farther south, as *Rhynchops nigra*, several species of *Laridæ*, and probably *Chamæpelia passerina*. In the third and more extensive class are to be ranged the stragglers proper; species observed for the most part but once, whose appearance is wholly fortuitous, depending upon no fixed habit of the bird. Thus, several species of Sea-Ducks (*Fuliguliniæ*); three species of the pelagic family *Procellariidæ*, *Graculus dilophus*, *Tyrannus verticalis*, *Milvulus forficatus ?*, *Chondestes grammicus*, the European *Mareca penelope*, have all been observed in the District or immediate vicinity. Such occurrences are always interesting, and should properly be enumerated in making up a list; but they take no part in the regular order of things.

The great mass of the birds which pass through the District in their spring migrations do not stop to breed before reaching, at least, the Alleghanian or Canadian fauna in regions north and east of us, in the latitude of New England and New York, or the same fauna farther south at higher elevations north and west of us in the Appalachian chain. Probably the majority go still farther north, to Labrador, the Hudson's Bay regions, and even Arctic America. Our regular winter visitants, as well as those which straggle at times from the north, do not, as a rule, breed anywhere in the United States. Some, however, like *Dendrœca æstiva*, breed anywhere, apparently independent of latitude. Our regular fall migrants for the most part pass on through the United States to winter in the West Indies and Central or even South America, though some linger through that season along the Gulf coast. The manner in which these extensive migrations are performed varies, doubtless, in different cases, and it is very difficult to understand how some of the weak, short-winged birds accomplish such immense distances. The manner is almost as much of a mystery as are the impelling, controlling, and guiding causes, none of which have ever been satisfactorily explained. Some birds appear to perform the long journey by continually flying from forest to forest, or from hedge to hedge; but, as a rule, birds mount directly high into the air, and continue an uninterrupted flight until hunger or weariness compels them to desist. This continuous kind of migration is performed by some species at night. Some of the small insectivorous birds have been observed just at daybreak to descend from a great height, and after remaining motionless for a while, as if to recuperate their energies, search diligently for food, and resume their flight toward evening. Any one who has lived in the woods during the migratory season must have repeatedly heard the note passing birds high overhead, invisible in the darkness. The distanc which notes can be heard under these circumstances is surprising. have distinctly heard the notes of the Bobolink, in the daytime, w the bird itself was beyond the range of vision. The loud honkin wild geese while migrating is well known.

A circumstance which has great influence upon the appearanc birds in the District, as a perturbating element in conditions other natural, is the presence of a large city. The resulting modificatio the number of species and of individuals and in their habits is m greater than formerly, now that the city has trebled its population wit twenty or twenty-five years, and suburban residences beyond act municipal limits have altered the face of the country very materia The general result, as usual, has been the entire extirpation of a species, and decided decrease in the numbers of many others. Thi strikingly shown in the cases of Ducks and other water-fowl, and of ga birds generally. The Chesapeake Bay and all its tributaries are speci adapted to the winter residence of water-fowl, and still would be a favo resort did not the incessant persecution to which these birds are subjec force them to seek safer quarters in the bays and inlets of more south shores. The same is true of various shy and solitary birds which h gradually retired, wholly or in greatest part with the clearing up of forests, to more mountainous or other secluded and less accessible gions. The Wild Turkey has been practically exterminated, tho still lingering near us; and so has doubtless the Sand-hill Crane. Pileated Woodpecker is nearly in the same predicament, though still s once in a while. The modification has no doubt been greater during period between the two editions of our List than in all time previou and we have been obliged to bear this constantly in mind in remode our notices of the species. Nevertheless, the pertinacity with w some birds hold their ground is surprising; the common Partridge, example, being still found near the city, though so incessantly pe cuted. A few birds appear to increase in numbers with the openin of country, their insect fare, probably, being improved, and some their natural enemies being restrained. Examples of change of ha consequent upon the settlement of the country are afforded by Swallows, Swifts, and some other species. The Chimney Swift form bred in hollow trees, but now finds chimneys entirely eligible. Barn Swallow now breeds entirely on the rafters and beams of houses; the Purple Martin gives preference to the boxes now eve where placed for its convenience; the Cliff Swallow has abandoned rocks for the eaves of houses. The Bluebird, House Wren, and Pe Flycatcher are almost as domestic; we have the Chip-bird in the tre and even the Owl in the belfry.

A very disturbing element has been introduced since our List or nally appeared; namely, the European Sparrow. Though nearly ev one—even among those who were instrumental in importing the pest—admits that we made a great blunder, all are slow to be persuaded of the enormity of the mischief these little creatures will work in the course of time. With this, however, we have here nothing to do; we only bring up the subject in connection with the decrease in the number and variety of our native singing birds in the city itself. This is a fact which probably every one has noticed, and which few pretend to deny any longer. It is *not* due to the building up of the city and the increase in the population, as some have supposed. The city is parked and preserved nearly throughout, and full of shade and ornamental trees. The actual number of trees is vastly greater than it was in the cow-pasture days of the *ante bellum* epoch; and there is no reason why those birds which ordinarily inhabit cities should not be at least as numerous as ever, or rather more so, were they not driven away by the Sparrows. It would perhaps be more accurate to say, were they not crowded and elbowed out of the way; the impress made by the sturdy little foreign vulgarians upon the native population being effected rather by their numbers, their persistency, turbulence, and noisiness, than by their pugnacity or aggressiveness; though downright acts of hostility may be continually witnessed. In fine, there is not food and room enough for many other birds where Sparrows are numerous.

We should not close this slight sketch without special reference to the phenomenal season of 1882, in which the ordinary course of migratory events was interrupted in an unprecedented manner. We had, in fact, a "tidal wave" of birds during the second and third weeks in May. It stormed for ten days, up to about the middle of the month, and before the cold rain ceased there was such a gathering of birds in the city as had never been witnessed by the "oldest inhabitant." Many thousands of birds filled the streets and parks; so great was the number and so brilliant the assemblage that the newspapers took it up and published their notes and queries. To account for the unwonted apparition, some one started the story that a vessel, just arrived at a wharf in Georgetown from the West Indies, had brought a cargo of tropical birds which had in some manner escaped! And no wonder, when the city was swarming with Scarlet Tanagers, Golden Orioles, Rose-breasted Grosbeaks, Redstarts, Summer and other Warblers, all as strange to the average Washingtonian as the most brilliant exotic birds could be. Yet these lovely creatures are with us always for those who can see and feel.

In the back yard of a private residence—a space 20 by 40 feet, containing one peach tree and some grape vine—we counted six species at once; a Baltimore Oriole, a Canada Flycatcher, a Redstart, a Summer Yellow-bird, a Black-Throated Blue Warbler, and a Chestnut-sided Warbler. In the parks it was common to see a flock of six or eight Scarlet Tanagers in one tree. There were flocks of Rose-breasted Grosbeaks in the Smithsonian Grounds; these birds were shot by boys near the city, one little fellow killing six. The most remarkable sight we witnessed ourselves was a great troop of a hundred or more Orchard Orioles in the Smithsonian Grounds, rambling with a few Baltimores over the new-mown grass like a flock of Blackbirds, while at the same moment, on turning the head, the black, white, and rose-color of the beautiful Grosbeak was seen contrasted with the green over head; Summer Warblers, Black-and-yellow Warblers, and Chestnut-sided Warblers were skipping together through the tender foliage; Hermit Thrushes were hiding in the evergreen shrubbery, and the ubiquitous Sparrows were chaffering and dickering on every hand.

The rare birds were in due proportion more numerous than ever before. We have knowledge of nine Cape May Warblers taken this season. The Golden-winged, Blue-winged Yellow, and Nashville Warblers were all not uncommon. Several specimens of the Connecticut Warbler, never seen here before in the spring, and the rare Mourning Warbler, seldom known to have been captured in the District, were also taken.

The weather was unquestionably the cause of this apparition. Considering the country at large, it held the birds back; they could not make their usual headway against so protracted a storm; and even after it ceased here, there was a cold wave north of us which retarded their advance. It also seemed to have deflected the ordinary line of migration from the highway of the Appalachian chain to the lower-lying land between these mountains and the sea-coast. In a word, a broad stream of birds flowing northward was contracted between comparatively narrow banks and then obstructed in its course, the District happening to fall just in the main channel. This seems sufficient to account for the phenomenon. As to the multitudes of birds in the city itself—for we cannot imagine the whole country round about to have been equally overcharged—we must suppose them to have been driven in by cold and hunger. They acted for the most part as though chilled and starved, showing no more fear of man than the Sparrows themselves, and some that were shot being found greatly emaciated.

Evidence of the correctness of this view of the case will be found by consulting the weather charts for the period in mention. Paragraphs in relation to the weather as affecting birds appeared in various northern journals, though nothing like the "tidal wave" we witnessed here seems to have been elsewhere noted.

With these cursory remarks we proceed to the annotated list of the species which have been ascertained to occur in the District. Our observations, from which this paper has been prepared, extend over a period of about twenty-five years, during which such time as could properly be spared from other pursuits has been devoted to the study of birds. No species has been admitted which has not actually been taken in the District or its immediate vicinity. We indicate the probable occurrence of a few more, none of which, however, are included in the enumeration. The dates given for the arrivals and departures of the non-residents are in any case the mean of those recorded during successive years, since they vary somewhat according to the speedy or tardy advance of the seasons. They may not in every instance be quite correct, for not to find a bird is at best but negative evidence of its absence. If, then, we say, for example, "arrives the middle of April and remains until the middle of September," we are to be understood to state that according to our observations the species in question is not ordinarily to be found before the first nor after the last of these dates. It is regretted that the accounts of some of the water-birds, notably the *Anatidæ*, are still incomplete with reference to the times of arrival and departure; but it is hoped that the very full particulars given of most of the land birds will in a measure condone this defect.

In the present edition the species are numbered 1 to 248 consecutively. With this numeration is retained in parenthesis that of the old List, for facility of cross-reference. The arrangement and nomenclature are altered entirely, being conformed to those of "the Coues Check List of North American Birds," etc.* The number which each species bears in that List is also affixed in brackets.

Order PASSERES: Passerine Birds.

Suborder OSCINES: Singing Birds.

Family TURDIDÆ: Thrushes.

Subfamily TURDINÆ: Typical Thrushes.

1. (18.) **Turdus migratorius** *Linn.* ROBIN.

A permanent resident, though probably not represented by the same individuals all the year round. A few breed, and a few remain during the winter; but the greater number pass through during the migrations, proceeding farther north for the summer, and farther south for the winter. It is most abundant during the months of March and

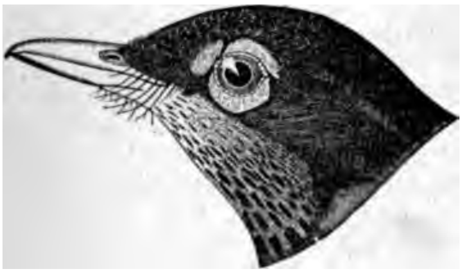


FIG. 1.—Head of Robin, nat. size.

---

* The Coues Check List of North American Birds. Second Edition, Revised to Date, and entirely Rewritten, under Direction of the Author, with a Dictionary of the Etymology, Orthography, and Orthoepy of the Scientific Names, the Concordance of previous Lists, and a Catalogue of his Ornithological Publications. Boston. Estes and Lauriat. 1882. 1 vol., imp. 8vo, pp. 165.

November, and found in all localities. Many individuals nest in the parks in the city, as those about the White House and the Smithsonian Institution. In the fall, the berries of the sour gum (*Nyssa multiflora*) and poke (*Phytolacca decandra*) are their favorite food. Two or three broods are reared each season. The nest, constructed largely of mud, is placed usually upon the bough of a tree; the eggs are 4–6 in number, uniform greenish-blue. [1]

2. (43.) **Turdus mustelinus** *Gm.* WOOD THRUSH; "WOOD ROBIN."

A summer resident. Many breed here, but the greater number go farther north. Arrives last week in April; leaves last week in October. It is a shy and retiring species, frequenting thick woods and tangled undergrowth, such as the laurel brakes along Rock Creek and elsewhere. The nest, placed in a bush or sapling, differs from that of the Robin in having no mud in its composition; the eggs are similar, but smaller. [6]

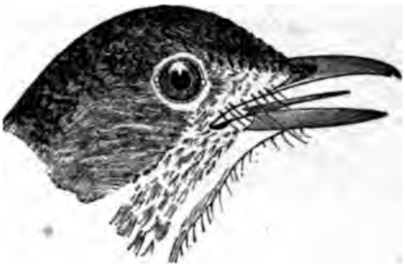


FIG. 2.—Head of Wood Thrush, nat. size.

3. (45.) **Turdus fuscescens** *Steph.* TAWNY THRUSH; WILSON'S THRUSH.

A spring and autumn visitant; rather uncommon, being the rarest of the Thrushes. It does not ordinarily arrive until the first week in May; it remains but a short time, and returns early in the fall. While with us it is a shy and solitary species, frequenting high open woods, but keeping near the ground. [7]

4. (44.) **Turdus unalascæ nanus** (*Aud.*) *Coues.* (*T. pallasi* of the original edition.)
EASTERN HERMIT THRUSH.

A spring and autumn visitant; does not breed here. It arrives much the earliest of all the Trushes, usually the third week in March; immediately becomes abundant, and is found until May. In the fall it returns the first week in October, and remains until the third or fourth week of that month—sometimes into November. Frequents chiefly open woods. [10]

5. (47.) **Turdus ustulatus aliciæ** (*Bd.*) *Coues.* (*T. aliciæ* of the original edition.)

A spring and autumn migrant; does not breed here. It is apparently as abundant as the Olive-back, more so than the Tawny; it is found in the same localities that the Olive-back frequents; and its times of arrival and departure are about the same. It is perhaps fonder of swampy places. This interesting species was first shown to belong to the eastern Avifauna by ourselves (see Pr. Phila. Acad. Nat. Sci., Aug., 1861, p. 217). [12]

6. (46.) **Turdus ustulatus swainsoni** (*Cab.*) *Coues.* (*T. swainsoni* of the original edition.) EASTERN OLIVE-BACKED THRUSH.

A spring and autumn migrant; does not breed here. The most abundant of the Thrushes, excepting perhaps the Hermit; we have seen them in considerable flocks in the fall. Arrives the second week in April, remains but a short time, and returns in the fall the second week in September, finally departing the second week of the following month. [13]

Subfamily MIMINÆ: Mocking Thrushes.

7. (100.) **Mimus polyglottus** (*Linn.*) *Boie.* MOCKING-BIRD.

A summer resident; rare. Arrives April 25; departs about the middle of September. This may be considered about the usual northern limit of the Mocking-bird, though it has occasionally been seen in New England, and in the West up to 42°. It breeds abundantly in Southern Maryland, some 60 or 80 miles below Washington. Nest in a bush, bulky, of sticks, &c.; eggs speckled. [15]

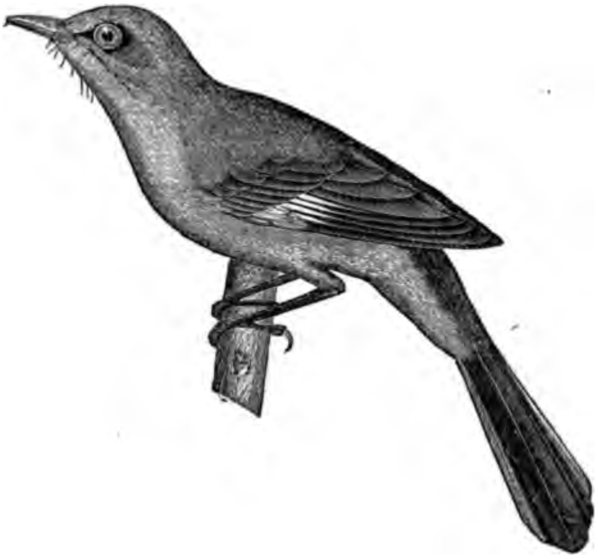


FIG. 3.—Mocking-bird.

8. (101.) **Mimus carolinensis** (*Linn.*) *Gray.* CAT-BIRD.

An extremely abundant summer resident; arriving the third week in April, remaining until about the middle of October. It is found in thickets and shrubbery, in all the briar-patches, along fences and brush-heaps; the nest is built in bushes, often in the heart of a smilax, and is one of those most frequently found, as the birds are careless of its concealment, however vigilant and solicitous for its protection. The eggs are greenish-blue, without markings, like those of the Robin but smaller. Some pairs always nest in shrubbery in the parks and gardens within city limits. [16]

9. (102.) **Harporhynchus rufus** (*Linn.*) *Cab.* BROWN THRUSH; THRASHER; "FRENCH MOCKING-BIRD;" "SANDY MOCKING-BIRD."

An abundant summer resident; arrives about the 20th of April, remaining until early in October. It frequents thickets, brushwood, and undergrowth of other kinds, particularly along Rock Creek. The nest is usually placed in a low bush; the eggs are 4–6 in number, speckled. This is one of our finest songsters, having like the Cat-bird considerable powers of mimicry as well as its proper song. [17]

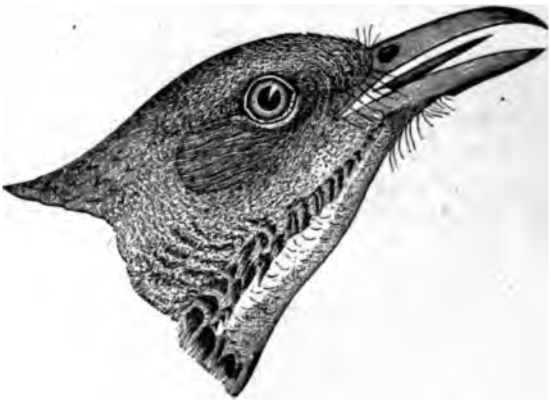


FIG. 4.—Head of Brown Thrush. nat. size.

Subfamily SAXICOLINÆ: Blue-birds.

10. (49.) **Sialia sialis** (*Linn.*) *Haldem.* BLUE-BIRD.

A very abundant and permanent resident. It disappears in severe winter weather, but is found on warm sunny days during that season, and becomes extremely numerous at the first blush of spring. It nests plentifully within city limits as well as in the surrounding country, building in holes in trees and fences as well as in the boxes set up for its accommodation; the eggs are 4–6, pale bluish, unmarked. [27]

Subfamily REGULINÆ: Kinglets.

11. (50.) **Regulus calendula** (*L.*) *Licht.* RUBY-CROWNED KINGLET.

A very abundant spring and autumn migrant; does not breed here, and has never been observed in winter. In spring, appears from April 1 to May 10; in the fall, during the whole month of October and first few days in November; more numerous at this season than during the spring migration. It is generally distributed in woodland, but is found less frequently in high, open woods than in orchards, thickets, copses, and especially cedar patches. It comes into full song and feather before the leaves in the spring. The vernal migration always includes a number of individuals of both sexes without the ruby crown. [33]

12. (51) .**Regulus satrapa** *Licht.* GOLDEN-CRESTED KINGLET.

A winter resident, abundant from October 1 to the latter part of April; does not breed here. It is a familiar and heedless little bird, whose general habits are much the same as those of the Ruby-crown. It is generally distributed, but thick pine woods are a favorite resort. [34]

Subfamily POLIOPTILINÆ: Gnatcatchers.

13. (110.) **Polioptila cœrulea** (*Linn.*) *Scl.* BLUE-GRAY GNATCATCHER.

A summer resident; still common, but less so than formerly. We used to see it in tall trees anywhere about the skirts of the city, but it appears to have retired to the surrounding woodland, where it breeds sometimes at great heights. It is an early arrival, usually by the first week in April, before the trees are fairly out, and remains until the latter part of September. It is one of the most restless of birds, almost incessantly in motion, and in spring continually uttering its thin, shrill notes as it darts about the tree-tops. [36]

Family PARIDÆ: Titmice.

14. (111.) **Lophophanes bicolor** (*Linn.*) *Bp.* TUFTED TITMOUSE.

A permanent resident, and extremely abundant, especially in the fall, when individuals which have bred farther north are here for the winter or passing south. In this and many other cases of birds which appear to be sedentary, from the fact that they are always to be found, it is not to be presumed that they are represented by the same individuals all the year round. Almost all birds of the northern hemisphere are migratory, and therefore only "permanently resident" in those localities which are within the limits of their migration both ways. The Tufted Titmouse is found in all localities in the District, occasionally within city limits. It is generally seen in small flocks or mixed company, and nests in holes of trees, stumps, and fences, laying numerous white speckled eggs. It is a noisy, petulent, and heedless little bird, possessing also much courage in self-defense, or in protecting its nest. [40]

15. (112.) **Parus atricapillus** *Linn.* BLACK-CAPPED TITMOUSE; COMMON CHICKADEE.

In the original edition, we gave this species as a winter resident, and correctly so, though the name has recently been expunged from the list by Mr. Jouy (Cat. B. of D. C., 1877). Mr. R. Ridgway distinguishes it specifically from *P. carolinensis*, and he informs us, as we presume he did Mr. Jouy, that all our Tits are of the latter species. But, aside any question of specific distinction, it seems that Tits from Balt are admitted to be *P. atricapillus*, and it is unlikely that forty divides the two species in such complete manner. It seems that after all the two boys may have been right in stating, as they did with hesitation in 1862, that *P. carolinensis* is the ordinary summer Tit; and that specimens indistinguishable from ordinary *atricapillus* occur in winter.

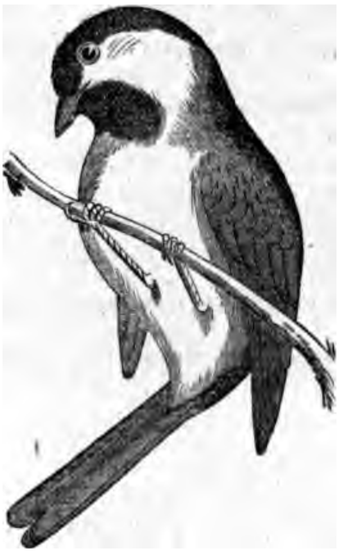


Fig. 5.—Black-capped Titmouse.

Mr. William Palmer considers the latter to be rare, his specimens having all been taken in very severe winter weather. His first specimen was shot at Arlington, December 25th, 1878, and others were secured by him at Falls Church, January 2d, 1879. Mr. Henry Marshall has taken it at Laurel, Md. [44]

16. (113.) **Parus carolinenis** *Aud.* CAROLINA TITMOUSE.

A summer resident; abundant. (See remarks under preceding species. Owing to the close resemblance between these two species, we have not been able to ascertain their times of arrival and departure.) [47]

Family SITTIDÆ: Nuthatches.

17. (108.) **Sitta carolinensis** *Gm.* CAROLINA NUTHATCH; WHITE-BELLIED NUTHATCH.

A very abundant permanent resident; especially numerous in the fall. Frequents high open woods; nests in holes. [57]

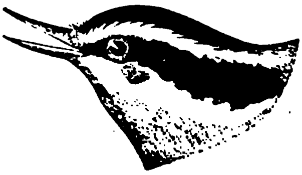


Fig. 6.—[illegible]

18. (109.) **Sitta canadensis** *Linn.* CANADA NUTHATCH; RED-BELLIED NUTHATCH.

A winter resident, not common. Arrives early in October, and remains until May, frequenting high open woods, especially of pine. [59]

S. pusilla occurs as far north as the Great Dismal Swamp in Virginia, but has never been seen in the District.

Family CERTHIIDÆ: Creepers.

19. (107.) **Certhia familiaris** *L.* (*C. americana* of the original edition.) BROWN CREEPER.

Resident, abundant. Found chiefly in high open woods, occasionally on the ornamental trees of the parks of the city, as in the Smithsonian Grounds and elsewhere. It is certainly migratory, but the remarks made under head of *Lophophanes bicolor* apply here. [62]

Family TROGLODYTIDÆ: Wrens.

20. (103.) **Thryothorus ludovicianus** (*Linn.*) *Bp.* GREAT CAROLINA WREN.

A permanent resident; not abundant at any season, but most so during the summer. It breeds in thick shrubbery of ravines and hillsides, sometimes in gardens, occasionally in the city itself. One year, at least, there was a pair in Mr. Corcoran's grounds on H street, near Sixteenth. The bird is very shy and retiring at most seasons, its rich rolling notes being heard oftener than the performer himself is seen. [68]

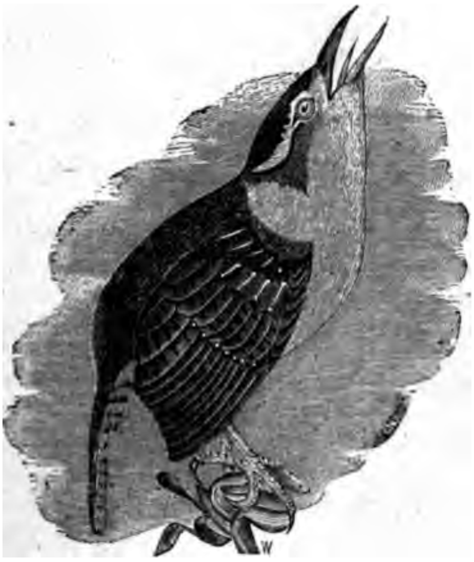


FIG. 7.—Great Carolina Wren.

21. (—.) **Thryothorus bewicki** (*Aud.*) *Bp.* BEWICK'S WREN.

original edition. Very rare, perhaps only casual. Observed
Mr. William Palmer, at Arlington, April 10, 1882. The

specimen is now in the United States National Museum, No. 86218, as noted by Mr. Ridgway in the Bull. Nuttall Ornith. Club, vii, 1882, p. 253. [71]

22. (105.) **Troglodytes domesticus** (*Bartr.*) *Coues.* (*T. aëdon* of the original edition.) HOUSE WREN.

A very abundant summer resident, arriving April 15, leaving October 20. It breeds in holes anywhere about dwelling-houses, and in the heart of the city as often as elsewhere, any garden-patch or bit of shrubbery sufficing to tempt the familiar little creature to a summer residence. Formerly very common in the city. Now rarely seen. [74]

23. (106.) **Anorthura troglodytes hiemalis** (*Wils.*) *Coues.* WINTER WREN.

Winter resident; rather uncommon. Arrives first week in October, about the time the Snow-birds come, or a few days earlier, and remains until the latter part of April. It frequents thick briar patches in dark woods, the rocks and gullies about ravines, and along the banks of creeks, where it threads its way like a mouse and is not easy to find. It is uncommon enough to be something of a prize to the collector, and we have never heard its song, as it leaves before the sexual impulse stimulates it to music. [76]

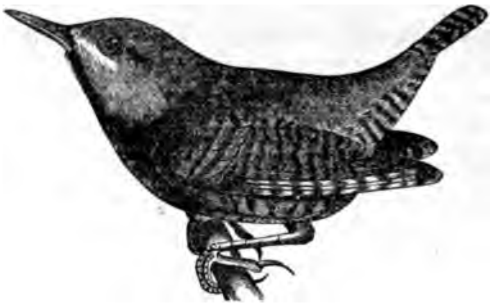


FIG. 8.—Winter Wren.

24. (104.) **Telmatodytes palustris** (*Bartr.*) *Cab.* LONG-BILLED MARSH WREN.

A summer resident. Arrives the third week in April, and remains until early in October. This Wren is extremely abundant, but only in certain localities, chiefly the marshes bordering the Potomac and Anacostia, where the stretches of wild oats (*Zizania aquatica*) furnish a congenial home. Hundreds of the large globular nests, affixed to the swaying reeds, used to be found in the bit of marsh bordering the Lee estate, and thence toward the Virginia end of Long Bridge. The eggs are remarkably dark-colored, being so heavily marked with chocolate-brown as to be almost uniformly of that color. [79]

The Short-billed Marsh Wren, *Cistothorus stellaris*, though we have not been able to detect it, is doubtless to be found sparingly here, the District being entirely within its ordinary known range. We do not know, however, that it has ever been actually taken or seen here.

Family ALAUDIDÆ: Larks.

25. (114.) **Eremophila alpestris** (*Linn.*) *Boie.* (*E. cornuta* of the original edition.) HORNED LARK; SHORE LARK.

A winter resident. Arrives November 1 and remains until April. It exclusively inhabits bare, level meadows and open commons, always in flocks of greater or less extent. Before the city extended northward to the boundary line (when there was scarcely a house north of N street in the vicinity of Fourteenth) we used to find the Shore Larks plentifully on the commons we crossed in going to and from college. [82]

Family MOTACILLIDÆ: Wagtails.

Subfamily ANTHINÆ: Titlarks.

26. (52.) **Anthus ludovicianus** (*Gm.*) *Licht.* TITLARK; "SKYLARK."

A winter resident; abundant. This species makes its appearance towards the end of October, and remains until April, being always found in restless, straggling flocks, usually of considerable extent, roaming in desultory fashion over the open commons, bare meadows, and plowed fields, much such places that the *Eremophila* frequents. It also has a habit of alighting on the roofs of sheds and houses. We have seen it exposed for sale in large bunches in the markets. [89]

Family SYLVICOLIDÆ: Warblers.

27. (53.) **Mniotilta varia** (*Linn.*) *Vieill.* BLACK-AND-WHITE CREEPER; "SAPSUCKER."

A very common summer resident, but more abundant in spring and fall, during the migrations, as the greater number go farther north to breed. It arrives the first week in April, and is extremely numerous until May. It is generally found in high open woods, scrambling nimbly about the trunks and larger branches of the trees.

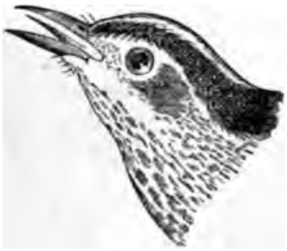


FIG. 9.—Head of Black-and-white Creeper, nat. size.

In the original edition we stated that the species breeds in holes in trees. This is a mistake. The nest is built on or near the ground. [91]

28. (54.) **Parula americana** (*Linn.*) *Bp.* BLUE YELLOW-BACKED WARBLER.

This exquisite little bird is a spring and autumn migrant, extremely abundant from April 25 until May 15. Perhaps a few breed with us, as we have found them the first week in August, some time before the Warbler migration sets in. In the autumn the Yellow-back is abundant from

August 25 to the second week in October. At any season it inhabits high open woods, and is usually seen in the tops of the trees or at the ends of the branches, scrambling, skipping, and fluttering with incessant activity on the tufts of leaves and blossoms. One which we procured was a partial albino, singularly variegated with pure white in patches amidst its normal markings. [93]

29. (55.) **Protonotaria citrea** (*Bodd.*) *Bd.* PROTHONOTARY WARBLER.

Extremely rare; apparently only an accidental visitor. It ought, however, to be regularly found here, even if rarely, as it goes north to New England. We have not learned of more than one occurrence, that of an individual seen by ourselves in a swampy briar patch, May 2, 1861. [95]

30. (60.) **Helmintherus vermivorus** (*Gm.*) *Bp.* WORM-EATING WARBLER.

A rather uncommon summer resident, breeding sparingly. We used to shoot it at any time during the summer, particularly in the wooded ravines along Rock Creek, and did not consider it rare, though we doubtless often overlooked it, owing to its close general resemblance to *Siurus auricapillus*, which was extremely abundant in the same places. It is slow and sedate in its movements, and is often seen rambling over the ground, whence, when disturbed, it flies to some low branch of a tree, much after the manner of the species just named. Of late years several nests have been taken, one that we know of by Mr. Jouy, and another by Mr. Palmer, the taxidermist of the Smithsonian. The bird arrives the first week in May, and remains until the third week in September. [96]

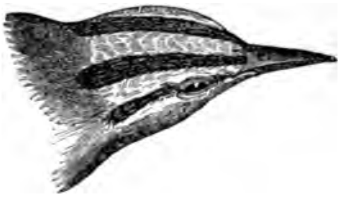


FIG. 10.—Head of Worm-eating Warbler, nat. size.

31. (62.) **Helminthophila pinus** (*Linn.*) *Bd.* BLUE-WINGED YELLOW WARBLER.

Spring and autumn migrant; very rare. Found on wooded hillsides and in tangled thickets. [98]

32. (61.) **Helminthophila chrysoptera** (*Linn.*) *Bd.* GOLDEN-WINGED WARBLER.

Spring and autumn migrant. Found in the tops of large trees in open woods; may be recognized from its habit of hanging head and back downward, when the golden wing-bars become prominent. [102]

33. (63.) **Helminthophila ruficapilla** (*Wils.*) *Bd.* NASHVILLE WARBLER.

Spring and autumn migrant; rare. It was, however, not uncommon in the spring of 1882. [106]

34. (64.) **Helminthophila peregrina** (*Wils.*) *Cab.* TENNESSEE WARBLER.

Spring and autumn migrant; very rare. Mr. William Palmer informs us of one he shot at Arlington, September 28, 1882. [109]

Our observations warrant the belief that the *Helminthophilæ* are rare birds here. Only these four species have ever been found, and the data with regard to their times of arrival and departure remain to be ascertained, as they did twenty years ago. Doubtless all four actually occur each season, but they are all local prizes, not to be had every year. Several specimens of *pinus*, *chrysoptera*, and *ruficapilla* were taken in May of "the great '82."

35. (76.) **Dendrœca æstiva** (*Gm.*) *Bd.* SUMMER WARBLER; YELLOW WARBLER.

A summer resident; very abundant. It breeds in numbers in the city, placing the nest in the forks of twigs in garden, orchard, and ornamental trees. It is scarcely to be found in high open woods with the other *Dendrœcæ*, being almost as domestic in its tastes as a House Wren. It arrives April 25, and the city is soon enlivened with its blithe, familiar notes, reiterated at frequent intervals as the golden little body flutters through the opening shade trees of the streets and parks. The greater number pass on in May, returning in September, during which month all leave for the south. [111]

36. (68.) **Dendrœca virens** (*Gm.*) *Bd.* BLACK-THROATED GREEN WARBLER.

Spring and autumn migrant; does not breed here. In spring, May 1 to 20; in fall, September 7 to October 2. Abundant during these periods in high open woods. [112]

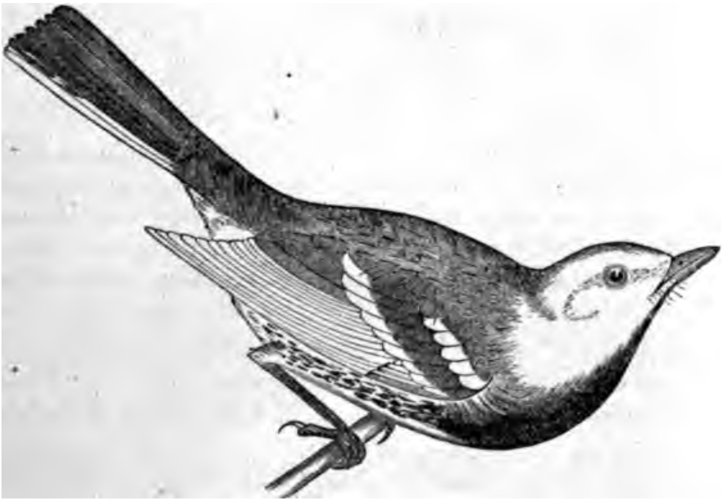


FIG. 11.—Black-throated Green Warbler, nat. size.

37. (69.) **Dendrœca cœrulescens** (*Linn.*) *Bd.* BLACK-THROATED BLUE WARBLER.

Spring and autumn migrant, like the preceding, and during the same periods; rather less numerous, and perhaps oftener seen in thickets. [117]

D. cærulea, the Cærulean Warbler, undoubtedly occurs, and will be found in the course of time; but we have never known it to be seen here.

38. (70.) **Dendrœca coronata** (*Linn.*) *Gray*. Yellow-rumped Warbler.

A *winter* resident; extremely abundant, especially during the spring migrations, when the numbers which pass the winter are recruited by arrivals from the South, before all go off together. They arrive from the North the first or second week in October, and do not disappear until the second week in the following May. They are songless whilst with us, having only a simple chirping note, but just before they leave they acquire their complete wedding dress, having moulted in April. The process seems to be protracted during the whole of that month, when most individuals shot are found to be in patchy garb; spick-span specimens, however, are to be caught early in May, just before they leave. They are most numerous in April and October, least so in the depth of winter. They are to be found everywhere, but are fondest of hedges, copses, orchards, and cedar thickets, which they haunt in troops, accompanied by titmice and sparrows. A specimen was taken in spring ot 1882, in which the throat patch had a decided yellow tinge to the new feathers, looking very much like an Audubon's Warbler. [119]

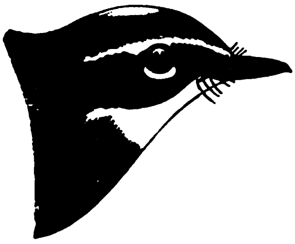


FIG. 12.—Head of Yellow-rumped Warbler, nat. size.

39. (71.) **Dendrœca blackburnæ** (*Gm.*) *Bd.* Blackburn's Warbler.

A spring and autumn migrant; does not breed here. In spring, May 1 to the 20th; in fall, September 1 to the 25th. Common in high, open woods, with *virens*, *cærulescens*, *striata*, and others. Very lovely specimens of this Prometheus unbound are to be had just before their departure in spring. In 1882 they entered the city like the many other beautiful sylvan apparitions which graced that memorable season, and we saw them for several days flashing through the streets and parks. [121]

40. (75.) **Dendrœca striata** (*Forst.*) *Bd.* Black-poll Warbler.

An abundant spring and autumn migrant; none breed here. In spring, May 7 to June 1; in fall, September 1 to second week in October. Thus at both seasons the Black-poll arrives latest and stays longest of all the

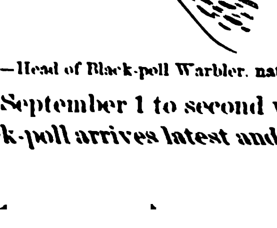


FIG. 13.—Head of Black-poll Warbler, nat. size.

strictly migratory Warblers. They are also the most numerous of all, particularly in the fall. High, open woodland, everywhere. In the spring when the Black-polls appear in force we may know that the collecting season for Warblers is about over. [122]

41. (72.) **Dendrœca castanea** (*Wils.*) *Bd.* BAY-BREASTED WARBLER.

Spring and autumn migrant; none breed here. In spring, May 1 to 20; in fall, during the whole month of September, and more numerous than at the other season, for in spring they are not to be entirely depended upon. They are usually to be found in high, open woodland, but sometimes in mixed young timber, laurel brakes, &c. [123]

42. (74.) **Dendrœca pennsylvanica** (*Linn.*) *Bd.* CHESTNUT-SIDED WARBLER.

An abundant spring and autumn migrant; does not breed here. In spring, from May 1 to the 25th; in fall, September 1 to the 20th. Found in high, open woods. In 1882 the little creatures showed their snowy bosoms and pretty chestnut lacings on the streets. [124]

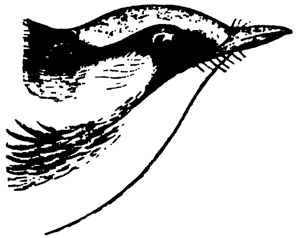


FIG. 14.—Head of Chestnut-sided Warbler, nat. size.

43. (77.) **Dendrœca maculosa** (*Gm.*) *Bd.* BLACK-AND-YELLOW WARBLER; MAGNOLIA WARBLER.

An abundant spring and autumn migrant; does not breed here. Arrives first week in May, and remains through the third; reappears by the first of September, and does not depart till the second week in October. This is another of the beautiful birds which graced the fancy ball we had in '82. [125]

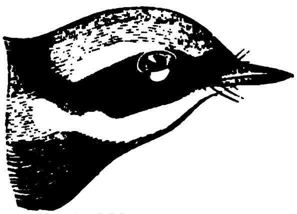


FIG. 15.—Head of Magnolia Warbler, nat. size.

44. (78.) **Dendrœca tigrina** (*Gm.*) *Bd.* CAPE MAY WARBLER.

Extremely rare; a migrant only, with times of arrival and departure doubtless not peculiar. We obtained a single specimen September 12, 1859, in what was then "Hawes' woods," now opposite the Schützenfest Park on Seventh street. This remained a unique occurrence till 1882, when Cape May came to Washington. We saw none actually in the

38. (70.) D

A *winte*
migration
arrivals f
North th
the seco
us, havi

acqu
proc
mos
men
The
wi
co
p
l
f

Of the species of *Dendrœca* known to occur in North America, fourteen have been found in the District. There has been no addition to the list since 1862. Not one of the fourteen is a permanent resident. Only three breed here (*æstiva*, *discolor*, *pinus*); only one is found in winter (*coronata*); there are nine spring and autumn migrants, of which seven (*virens*, *cœrulescens*, *blackburnæ*, *castanea*, *pennsylvanica*, *striata*, *maculosa*) do not differ materially in numbers, habits, resorts, or periods of migration. One (*palmarum*) differs notably in these particulars; one (*tigrina*) is extremely rare; one (*dominica*) is merely a straggler. There is at least one more to come into the list (*cœrulea*).

49. (65.) **Siurus auricapillus** (*Linn.*) *Sw.* GOLDEN-CROWNED THRUSH; OVEN-BIRD.

An extremely abundant summer resident. It arrives April 12, and for about two weeks keeps perfectly silent, hiding in the thickets and laurel brakes (*Kalmia latifolia*), until the spur of the sexual exaltation is felt. About the 1st of May its loud, harsh, monotonous notes fill the woods, greatly to the annoyance of the collector who searches with his senses all on the alert for rarer and more retiring species. To atone for this, however, a little later still in the season, the bird breaks forth in a song of exquisite pathos and extraordinary power. It is found anywhere in woodland, but particularly where high timber shadows thick undergrowth. The ravines and hillsides along Rock Creek, where the forests tower over the brakes, fairly resound with the accelerated chant of the Golden-crown during the latter part of April and early in May. It is not at all aquatic, but is fond of rambling over the ground and rustling among the fallen leaves for insects. When disturbed, it takes a short flight to the nearest convenient bough, where it sits motionless, watching the intruder. The nest is built on the ground, more or less arched over, and contains white, spotted eggs. [135]

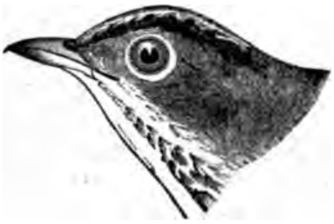


FIG. 16.—Head of Golden-crowned Thrush, nat. size.

50. (66). **Siurus nævius** *Bodd. Coues.* (*S. noveboracensis* of the original edition.)
WATER WAGTAIL; SMALL-BILLED WATER THRUSH.

Quite common during the migrations. It also appears to breed here sparingly, as we have found it in July. Arrives in spring, according to our observations, about May 1, but so secretive and retiring a species may easily elude observation, and we should not be surprised to know that it comes along much earlier than we have ever known it to do. It is eminently aquatic; swampy thickets, marshes, and gloomy woods interspersed with puddles are favorite resorts. We have sometimes found it in such places associated with *Rhyacophilus solitarius*. [136]

51. (67.) **Siurus motacilla** (*Vieill.*) *Bp.* (*S. ludovicianus* of the original
*LARGE-BILLED WATER THRUSH.

This bird, generally considered so rare, we have found to b
all uncommon at certain seasons in particular localities. From t
of April to the 10th of May it may always be procured by a
collector in the dense laurel brakes which border the banks and
ravines leading into Rock Creek and Piney Branch. We have
as early as April 10, and we think we have seen it in June. If
ter observation be correct, it would prove it to breed here, as u
edly it does. We have not detected it in the fall. It is usua
shy, when disturbed darting at once into the most impenetrable
but we have sometimes seen it quite the reverse, and once sho
one after the other, as they sat in full view before us, uncon
wagging their tails. We have nearly always found it in pairs,
early as April 28. The usual note is a sparrow-like chirp, res
the sound made when two pebbles are struck together; but
also a loud and most melodious song, the beauty of which first d
attention to this attractive bird.

52. (57.) **Oporornis agilis** (*Wils.*) *Bd.* CONNECTICUT WARBLER.

Rather uncommon in the fall during the month of Octobe
extremely rare in the spring, and we have ourselves never se
that season excepting in 1882, when several specimens were
Mr. E. W. Nelson secured one in the District that year the
May. In May, 1879, one was taken at Falls Church by Mr. L.
mick, as we are informed by Mr. Palmer. In the fall of the y
comparatively easy to obtain. We cannot give the exact dat
arrival and departure. It frequents low thickets in swampy pla
also old buckwheat and cornfields, searching for food among t
dry weeds of autumn, not unlike the *Dendrœca palmarum.*

53. (58.) **Oporornis formosa** (*Wils.*) *Bd.* KENTUCKY WARBLER.

Rare summer resident, a few breeding with us; but its times o
and departure we have not ascertained. It is a quiet but not s

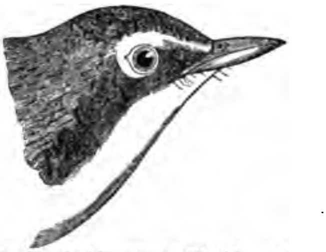


FIG. 17.—Head of Kentucky Warbler, nat. size.

found chiefly in low woods where the undergrowth is thickest,
vines leading into Rock Creek, and similar sequestered resort
H. W. Henshaw has found it nesting on Rock Creek, and Mr.
Palmer has secured three specimens, one on the Virginia side

river about half a mile above Aqueduct Bridge, August 19, 1877, and the others near Spring Vale, Fairfax County, Virginia, May 14 and 15, 1878. [140]

54. (56.) **Geothlypis trichas** (*Linn.*) *Cab.* MARYLAND YELLOW-THROAT.

A very abundant summer resident, breeding plentifully in all suitable localities. It arrives April 25, becoming suddenly very numerous, the males in full song. During the pairing and breeding season the energetic *whit’-itee, whit’-itee*, may be heard from almost any patch of briars or reeds, especially in swampy localities. The bird is never seen in high open woods, and seldom even in orchards and hedge-rows, but frequently in the tracts of *Zizania aquatica*, associated with the Marsh Wrens. The nest is built on the ground and artfully concealed; the eggs are white, speckled. The bird remains until October, and sometimes during a part of that month. [141]

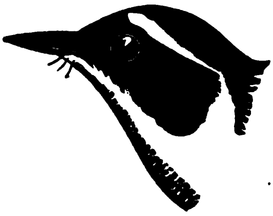


FIG. 18.—Head of Maryland Yellow-throat, nat. size.

55. (—.) **Geothlypis philadelphia** (*Wils.*) *Bd.* MOURNING WARBLER.

Not in the original edition, no specimen having been seen up to that date. One was observed by Mr. L. E. Chittenden in the spring of 1862, confirming the remark we had made that the species was "undoubtedly an inhabitant of the District." This discovery remained in our MS. until published by Mr. Jouy in 1877. Nothing further was heard of the rare straggler for nearly twenty years. Mr. William Palmer saw it for the first time in May, 1877, when he was unable to secure the individual. He, however, shot one on the 19th of August, 1877, about half a mile above Aqueduct Bridge. He observed two, one of which was shot at Laurel in May, 1878, and has still another shot at Falls Church, May 19, 1879. In the phenomenal season of 1882, in May, one was shot by ourselves in the undergrowth of a wooded hillside on Rock Creek, and another was seen in the same place, but not obtained, by Mr. H. W. Henshaw. These several individuals are the only ones we have heard of in the District. [142]

56. (59.) **Icteria virens** (*Linn.*) *Bd.* YELLOW-BREASTED CHAT.

This singular bird abounds in brushwood and shrubbery during the summer—more precisely, from the last week in April until the second or third week in September. The thickest and most obdurate briar patches suit it best. There, effectually screened from observation, it delights in the exercise of its extraordinary vocal powers, and is such an accomplished ventriloquist that one never knows where the bird making the strange sounds is secreted. It is also wary and vigilant, shifting its post on the least alarm, and adding to the perplexity of the collector who would possess himself of the brilliant green and golden trophy. Not less peculiar and exaggerated than its vocal efforts are the aerial evolutions it performs during the mating season. When this is over its extravagant antics cease, and the Chat becomes a much more orderly member of the feathered fraternity. We presume he would never behave as he does if the females had no hand in the matter; they appear to be the cause of all the disturbance. The nest is placed on a low bush, built chiefly of twigs and grasses; the eggs are 4 or 5, white, spotted, and blotched with reddish-brown. At the height of the breeding season the chrome-yellow of the throat is sometimes intensified in patches of red, a thing which also happens occasionally to the Prothonotary Warbler. [144]

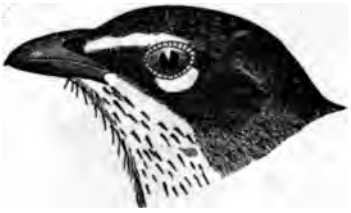


FIG. 19.—Head of Yellow-breasted Chat, nat. size.

57. (82.) **Myiodioctes mitratus** (*Gm.*) *Aud.* HOODED FLYCATCHING WARBLER.

A rare spring and autumn migrant; perhaps also a summer visitant. It is, however, little more than a straggler, and one concerning which we have scarcely any information to offer. In the spring of 1882 one was seen by Prof. Baird in the yard of his residence. [146]

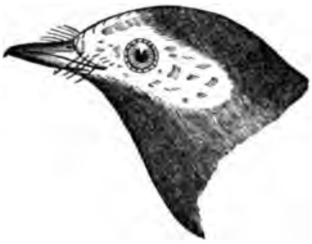


FIG. 20.—Head of Hooded Flycatching Warbler, nat. size.

58. (83.) **Myiodioctes pusillus** (*Wils.*) *Bp.* GREEN BLACK-CAPPED FLYCATCHING WARBLER.

A spring and autumn migrant. "A few may breed" was said in the original edition, but as yet we have no confirmation of this probably

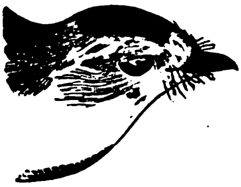


FIG. 21.—Head of Green Black-capped Flycatching Warbler, nat. size.

erroneous surmise. It has been found chiefly among young willows along the banks of streams, as Rock Creek and its tributaries. [147]

59. (84.) Myiodioctes canadensis (*Linn.*) *Aud.* CANADA FLYCATCHING WARBLER.

An abundant spring and autumn migrant, frequenting high open woods, where it keeps mostly among the lower branches of the trees, and also the more open undergrowth of marshy places. Arrives the ast week in April, and remains about two weeks; returns the first week in September, and stays until the fourth. [149]

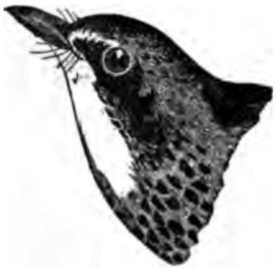


FIG. 22.—Head of Canada Flycatching Warbler, nat. size.

60. (85.) Setophaga ruticilla (*Linn.*) *Sw.* REDSTART.

This fiery little fellow, whose flaming colors reflect the ardor within, s chiefly a spring and autumn migrant, but very few individuals remaining during the summer to breed. It is extremely abundant in the spring, from April 25 to May 20, and no less so in the fall, from September 1 to the 20th of that month, in all woodland and wooded swampy places. The ordinary note is not unlike that of the Summer Warbler, but the actions and whole appearance are unmistakable. Its most characteristic actions are those of running sideways along small twigs, and incessant expanding of the tail. The spring migrations embrace males in a garb resembling that of the female; others in a patchy transition state to the perfected colors, and others, again, which have completed their toilet. [152]

Family TANAGRIDÆ: Tanagers.

61. (86.) Pyranga rubra (*Linn.*) *Vieill.* SCARLET TANAGER.

This brilliant creature is chiefly a spring and autumn migrant, but a few breed here. The spring passage is from the 1st to the last week of May; the autumnal, from the 1st to the 3d week of September. It is found in high, open woodland, and is quite common in the months named. In 1882 it came into the city with numberless other strange guests, which the people took to be exotic birds, and made a beautiful display; for example, a *flock* of Scarlet Tanagers was seen in one tree in the Smithsonian Grounds, making almost a tropical scene, with hundreds of Orioles, Rose-breasted Grosbeaks, Redstarts, and Warblers scarcely less gay. [154]

62. (87.) Pyranga æstiva (*Linn.*) *Vieill.* SUMMER TANAGER; SUMMER RED-BIRD.

A resident during the season to which the bird is dedicated, but not abundant. The genus and family are essentially tropical, *Pyranga* being the only North American form, and the present species being more restricted in its range than *P. rubra.* It does not arrive until May, and leaves about the third week in September. Its resorts are high, open woods, especially those containing much undergrowth. The nest is a shallow, flat structure, saddled upon a horizontal bough; the eggs are spotted. [155]

Family HIRUNDINIDÆ: Swallows.

63. (88.) **Hirundo erythrogastra horreorum** (*Bart.*) *Coues.* BARN SWALLOW.

An abundant summer resident; rather less so than formerly, there being more houses and fewer barns in the immediate vicinity of the city.

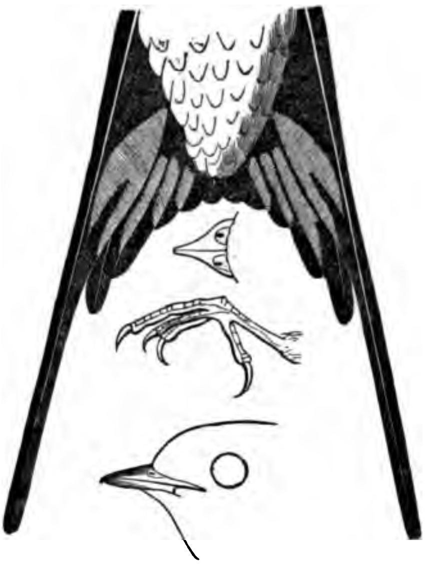


FIG. 23—Details of form of Barn Swallow.

Arrives March 25 (on an average) and remains until September 12, or a little later, varying different seasons with the weather. [159]

64. (90.) **Iridoprocne bicolor** (*Vieill.*) *Coues.* WHITE-BELLIED SWALLOW.

A common summer resident, but less abundant than the Barn Swallow. Arrives the first week in April and remains until September 12, or thereabouts, according to the weather. [160]

65. (89.) **Petrochelidon lunifrons** (*Say.*) *Cab.* CLIFF OR EAVES SWALLOW.

A summer resident, but not nearly so abundant as the Barn Swallow, owing to lack of suitable breeding places. Arrives last week in April and remains until September 12, or thereabouts. [162]

66. (91.) **Cotile riparia** (*Linn.*) *Boie.* BANK SWALLOW.

A summer resident; very abundant. It is the most numerous of the Swallows, particularly in the fall, just before its departure, when flocks of thousands are to be seen. There are many exposures along the river and elsewhere which afford eligible nesting sites to colonies of Bank Swallows. It usually arrives late, perhaps not till the second week in May, and departs about the middle of September. On the 23d of August, 1859, an albino was shot by Mr. Louis D. Coues, and the specimen is still preserved in the Smithsonian. [163]

67. (92.) **Stelgidopteryx serripennis** (*Aud.*) *Bd.* ROUGH-WINGED SWALLOW.

A summer resident, but not common. Still it may always be found along the Potomac in the neighborhood of Little Falls, where it breeds on the cliffs. Arrives the third week in April and departs about the middle of September. [164]

68. (93.) **Progne subis** (*Linn.*) *Bd.* (*P. purpurea* of the original edition.) PURPLE MARTIN.

A summer resident; common. Arrives the 1st of May and leaves early in September. Many still breed in the city, about the public buildings, nesting in the capitals of the columns, especially of the General Post-Office. But they have had a hard fight for it with the English Sparrows, and though able to hold their own when once engaged, they are so much harried and worried that their numbers have sensibly diminished since the introduction of the pests. [165]

Family AMPELIDÆ: Chatterers.

69. (94.) **Ampelis cedrorum** (*Vieill.*) *Bd.* CEDAR-BIRD; CEDAR WAXWING; "CEDAR-LARK."

Resident all the year round, and abundant, particularly in the fall. These birds are highly gregarious, being almost always seen in compact flocks. They breed the latest of all our summer residents, being observed to flock as late as the first week in June. They are less frequently observed during the breeding than at other seasons. In the fall, when they grow very fat, they are frequently offered for sale in the markets. [167]

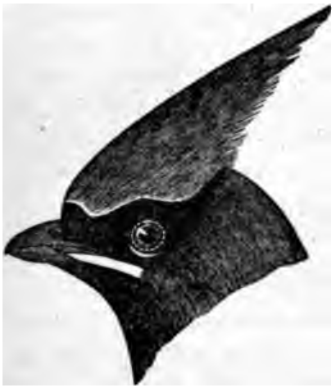


FIG. 24.—Head of Cedar-bird, nat. size.

Family VIREONIDÆ: Greenlets.

70. (96.) **Vireo olivaceus** (*Linn.*) *Vieill.* RED-EYED GREENLET.

A summer resident, and decidedly the most abundant of all the woodland birds during that season. It is found in every piece of high, open woods from the 15th of April to the 20th of September, and is one of the most industrious and persevering of songsters, whose voice not even the noon of the dog-days can still. [170]

Vireo philadelphicus, the Brotherly-love Greenlet, is undoubtedly a rare inhabitant of the District, liable to turn up any spring or fall.

71. (97.) **Vireo gilvus** (*Vieill.*) *Bp.* WARBLING GREENLET.

A common summer resident, arriving April 20 and remaining until September 20. It frequents orchards, gardens, and parks, sometimes swampy copses, but was specially abundant in the city, breeding in the tall sycamores and poplars, before the irritating English Sparrows diminished the numbers of the gentle, silvery-tongued creatures. [174]

72. (99.) **Vireo flavifrons** *Vieill.* YELLOW-THROATED GREENLET.

A summer resident, abundant in high, open woods. Arrives April 25; remains until September 25. The hanging basket in which the Greenlet cradles its hopes is one of the most beautiful of the pensile structures which birds of this family fabricate, being elegantly stuccoed with lichens, like a Gnat-catcher's or Humming-bird's. [176]

73. (98.) **Vireo solitarius** *Vieill.* BLUE-HEADED GREENLET.

This is much the rarest of the Greenlets; we have seldom observed it, and only during the migration; but some individuals doubtless breed with us. Arrives in the spring, April 25, and is sometimes found until October 20. It is a woodland species, like the Red-eyed and Yellow-throated. In the spring of 1882, like most other migrants, it was more numerous than usual. [177]

74. (—.) **Vireo noveboracensis** (*Gm.*) *Bp.* WHITE-EYED GREENLET.

By a pure oversight this species was omitted from the original edition of this catalogue, for we were perfectly familiar with the energetic, obtrusive little inhabitant of the shrubbery, where it resides in large numbers during the summer. It arrives late in April, and leaves the latter part of September. It has had hard work to get properly represented; we remember looking for it when the proofs of Mr. Jouy's list were submitted to our inspection, and making sure that it went in. [181]

Family LANIIDÆ: Shrikes.

75. (95.) **Lanius borealis** *Vieill.* GREAT NORTHERN SHRIKE, OR BUTCHER BIRD.

Very rare, and scarcely to be seen except in severe winter weather. We have only known of two or three specimens procured in the District, which appears to be about the southern limit of the species. [186]

76. (—.) **Lanius ludovicianus** *Linn.* LOGGERHEAD SHRIKE.

Not in the original edition. Rare or casual, but has several times been observed, and probably belongs to the category of permanent residents. Mr. William Palmer informs us that he obtained a specimen about the 6th of October, 1880, and that the Loggerhead has also been procured by Mr. Henry Marshall, at Laurel, Md. Mr. Ridgway has lately published the following note on the occurrence of the species in the District: "Several specimens of this irregularly distributed, and everywhere more or less local, species have within the last few years been taken in the vicinity of Washington, and are now in the collection of the National Museum. Most if not all of them were taken in winter." (Bull. Nutt. Ornith. Club, vii, 1882, p. 253.) [187]

Family FRINGILLIDÆ: Finches, &c.

77. (—.) **Passer domesticus** (*Linn.*) *Koch.* PHILIP SPARROW; ENGLISH SPARROW; EUROPEAN SPARROW; TRAMP; PARASITE; HOODLUM.

This nuisance was introduced some years after our list appeared; and so far from there being any prospect of its abatement it has increased each year. There is said to be a remedy for every ill under the sun, but none has been found as yet for this one, notwithstanding the ceaseless complaints and protests that we hear from all sides. The rowdy little *gamins* squeak and fight and do worse all through the city, to the annoyance and disgust of nearly all persons. In the aggregate the suffering they entail upon invalids and those prostrated by sickness is immeasureable. Washington harbors and encourages a select assortment of noise-nuisances—the black newspaper imps who screech every one deaf on Sunday morning; the fresh-fish fiends, the berry brutes, the soap-fat scoundrels, and the o' clo' devils; the milk mercenaries with their detonating gongs; but all these have their exits as well as their entrances; the Sparrows alone are tireless, ubiquitous, sempiternal. They begin just about the time one of the authors of this treatise generally goes to bed and tries to go to sleep—towards daybreak—and keep it up till their voices swell in a diapason of horror with those of the other unspeakable wretches above alluded to. They breed during the greater part of the year—breed at a year old—keep breeding—breed numberlessly. In place of many sweet songsters which used to grace and enliven our streets, we have these animated manure machines, as almost every house-owner in the city knows to his cost. Whatever may be said to the contrary notwithstanding, the Sparrows, besides persecuting the human species, do molest, harass, drive off, and otherwise maltreat and forcibly evict and attempt to destroy various kinds of native birds, which are thereby deprived of certain inalienable rights to life, liberty, and the pursuit of happiness after their own fashion. To offset all this what have we? Nothing, absolutely nothing. [192]

78. (115.) **Pinicola enucleator** (*Linn.*) *Vieille.* (*P. canadensis* of the original edition.) PINE GROSBEAK.

An extremely rare and probably only accidental visitor in severe winters. [190]

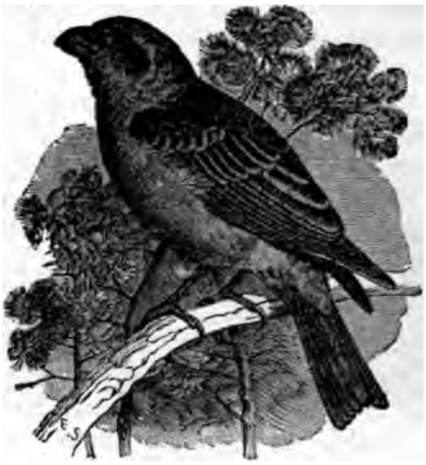


FIG. 25.—Pine Grosbeak.

79. (116.) **Carpodacus purpureus** (*Gm.*) *Gray.* PURPLE FINCH.

A winter visitant, very abundant at that season, and highly gregarious. It arrives from the North early in October, and remains until May; stragglers may indeed be seen during most of that month, but the majority of the birds depart as soon as the leaves are fully expanded and the buds and blossoms upon which they delight to feed are no longer to be secured. They frequent high, open woods, the shade trees along roadsides, the fruit trees of orchards, and come into full song before their departure. [194]

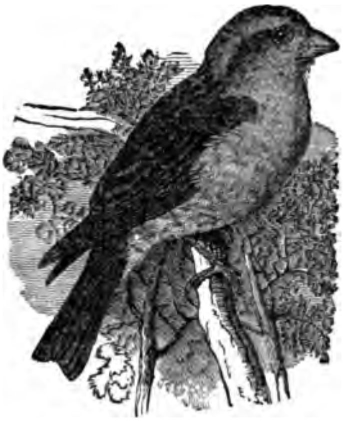


FIG. 26.—Purple Finch.

80. (—.) **Loxia leucoptera** *Gm.* WHITE-WINGED CROSS-BILL; and

81. (—.) **Loxia curvirostra americana** (*Wils.*) *Coues.* AMERICAN RED CROSS-BILL.

We said of these species in the original edition that both undoubtedly sometimes make their appearance in severe winters, though we had not been able to ascertain the fact with certainty. It has since been established, and both the Cross-bills have been introduced as stragglers in Mr. Jouy's catalogue. Mr. William Palmer states in a note addressed to us: "Early in December, 1874, I saw a flock of about 20 Red Cross-bills in a pine tree on the bank of the canal in Alexandria County, Virginia, and about two weeks later I shot one, a female, out of a flock of five. I have myself never seen the White-winged Cross-bill here, but Mr. Henry Marshall has specimens which he shot at Laurel, Md., about eight years ago, probably 1874, since which time he has seen none." [198, 199]

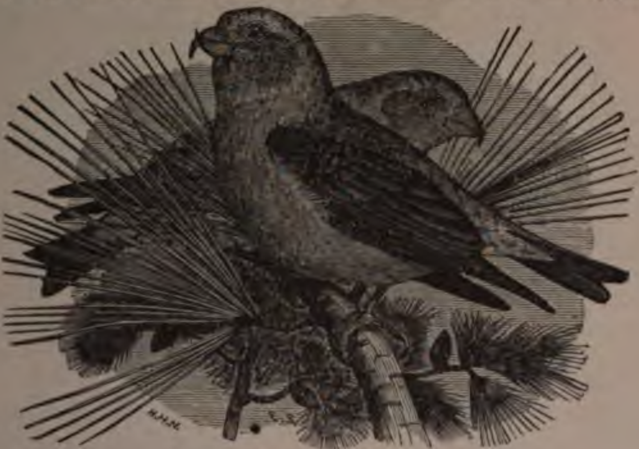


FIG. 27.—American Red Cross-bill.

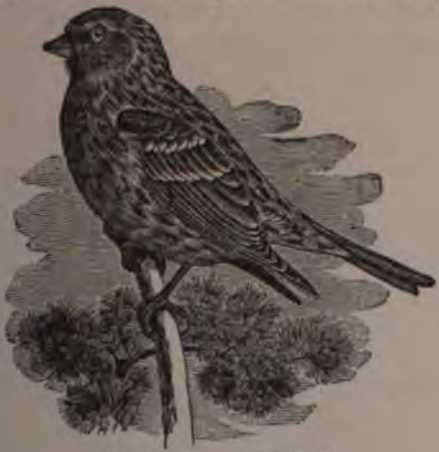


FIG. 28.—Common Red-poll.

82. (119.) **Ægiothus linaria** (*Linn.*) *Cab.* COMMON RED-POLL.

A rare and irregular, perhaps only accidental, visitor in severe winters, when it appears in restless, roving flocks of greater or less extent. [207]

83. (118.) **Chrysomitris pinus** (*Bartr.*) *Bp.* AMERICAN SISKIN; PINE LINNET.

A winter resident, rather uncommon. It is always in flocks with us, and frequently associated with Goldfinches. Its period of arrival from the North is uncertain, depending much upon the weather; it usually remains until May. [212]

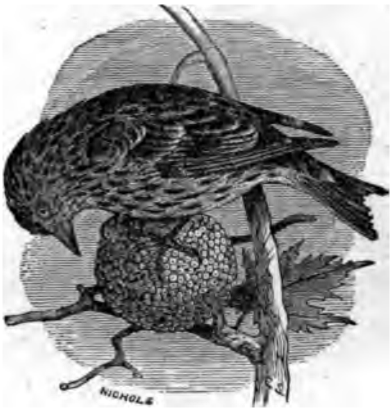


FIG. 29.—Pine Linnet.

84. (117.) **Astragalinus tristis** (*Linn.*) *Cab.* AMERICAN GOLDFINCH; YELLOW-BIRD; THISTLE-BIRD; "BRIER-BIRD."

A permanent resident, formerly exceedingly abundant, and still common, though sensibly diminished in numbers. This appears to be owing in part to the reclamation of large tracts formerly waste and full of rank weeds, partly to the multiplication of the English Sparrows. Goldfinches formerly bred all through the city, in the poplars and maples shading the streets, where none are seen now. They are gregarious out of the breeding season, collecting in large flocks about the 25th of

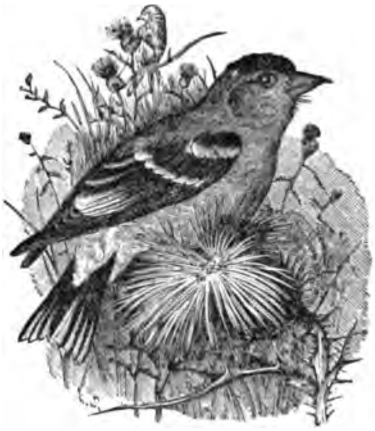


FIG. 30.—American Goldfinch.

September, and continuing so until May; the period of flocking coinciding very nearly with that during which birds are in the dull, "flaxen" attire. [213]

85. (120.) **Plectrophanes nivalis** *(Linn.) Meyer.* SNOW BUNTING; SNOW FLAKE.

A rare winter visitant in the depth of winter, wholly irregular and uncertain. [219]

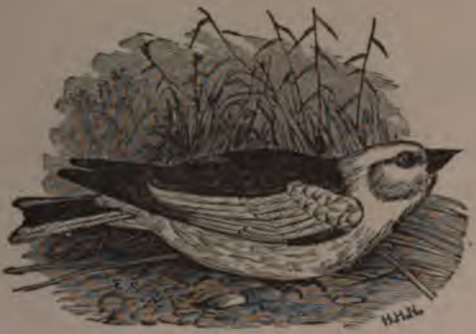


FIG. 31.—Snow Bunting.

P. lapponicus may also visit us occasionally under the same circumstances, but, if so, the fact remains to be determined, as it did in 1862.

86. (121.) **Passerculus sandvicensis savana** *(Wils.) Ridg.* SAVANNA SPARROW.

Chiefly a spring and autumn migrant; none breed here, but a few doubtless winter in secluded situations. It is very numerous on low, moist meadows and watery savannas from March 15 to the first week in May, and from October 10 to November 10. It is a shy and retiring species, keeping on the ground or among low, thick bushes, in companies sometimes of considerable size. It comes into full song before it departs in the spring. There is a wide range of individual and seasonal variation in size and color. [227]

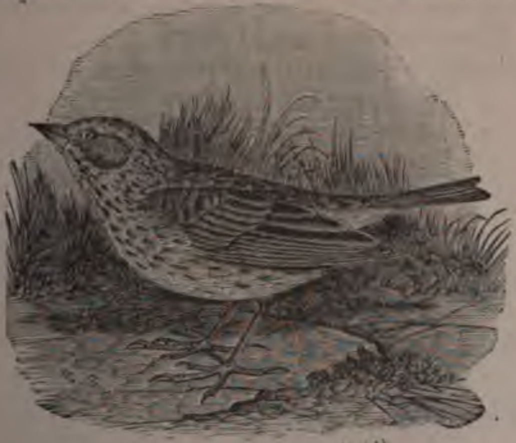


FIG. 32.—Savanna Sparrow.

87. (122.) **Poœcetes gramineus** (*Gm.*) *Bd.* GRASS FINCH; BAY-WINGED BUNTING.

Resident all the year; very numerous in spring and autumn, during the migrations, less so in summer and winter, as the greater number of individuals go farther north and farther south at the seasons named. It is to be found in high, dry fields; along roadsides and hedgerows, usually in small flocks, readily identified by the white feathers which show on each side of the tail as the bird flies. Besides the ordinary chirping note, it has a sweet and tender song during the breeding season, especially just at sun-down; whence the poetical name of "Vesper-bird." The nest is placed on the ground, so sunken that its brim is flush with the surface; the eggs are heavily spotted. [232]

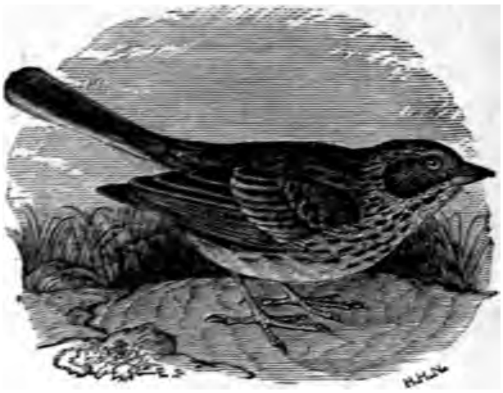


FIG. 33.—Grass Finch.

88. (123.) **Coturniculus passerinus** (*Wils.*) *Bp.* YELLOW-WINGED SPARROW; GRASSHOPPER SPARROW.

A summer resident, abundant in old weedy fields and seedy meadows, where it keeps closely concealed in the rank herbage, and is, therefore, not easily discovered. Its ordinary flight is very brief, rapid, and des-

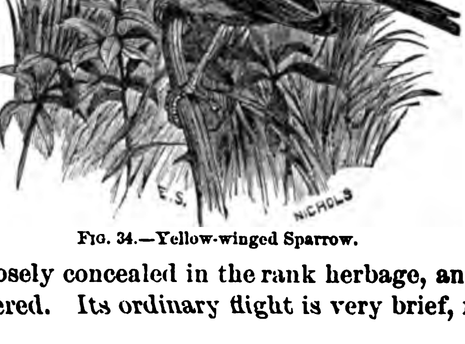


FIG. 34.—Yellow-winged Sparrow.

ultory; its song a singular chirruping, like the stridulation of some insect. It arrives April 25, and remains until the 25th of October. The nest is sunken in the ground, and contains four or five pure white eggs speckled with brownish-red. [234]

89. (124.) **Coturniculus henslowi** (*Aud.*) *Bp.* HENSLOW'S BUNTING.

A summer resident, common in certain localities, but apparently not generally distributed through the District. In the original edition we marked this species as "exceedingly rare," but a single specimen having up to that time been known to us to have been procured. Of late years, however, it has been frequently found by Mr. Jouy, Mr. Ridgway, and others, both in fields about Old Soldiers' Home and Rock Creek Church, and across the river, in Virginia, in the vicinity of Falls Church. The nest and eggs have been found by Mr. Jouy, who has published a notice of them. (Bull. Nutt. Ornith. Club, vi, 1881, p. 57.) [236]

90. (—.) **Ammodramus caudacutus** (*Wils.*) *Sw.* SHARP-TAILED FINCH.

Not in the original edition; rare and casual. Shortly after our list was published, Mr. C. Drexler took a specimen of this species, which is now in the United States National Museum, No. 25905, September, 1862. (See Ridgway, Bull. Nutt. Ornith. Club, vii, 1882, p. 253.) [240]

91. (133.) **Melospiza palustris** (*Bartr.*) *Bd.* SWAMP SPARROW.

Chiefly a spring and autumn migrant, though a few probably winter with the Song Sparrows in secluded places; doubtless none breed with us. It is one of the most retiring of all the sparrows, seldom coming under the observation of any but the most diligent and practiced ob-

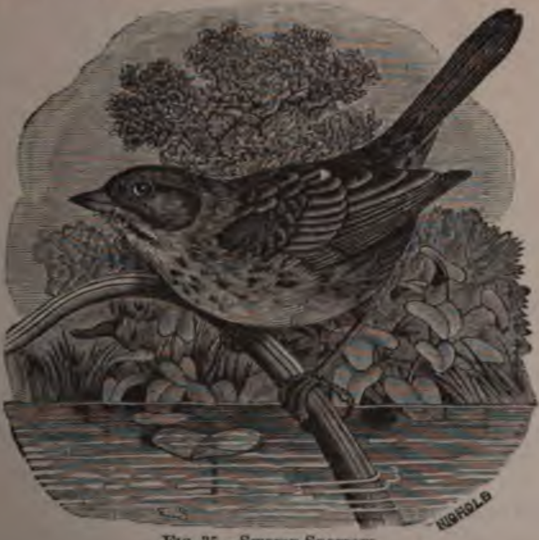


FIG. 35.—Swamp Sparrow.

servers. We have not observed it in spring before the last week in April, nor in the fall before the second week in October; but it comes and goes so slyly that it is very likely to be overlooked. It appears to be more numerous in the fall than at the opposite season. [243]

Melospiza lincolni, in all probability, is an inhabitant of the District, though we had never found it in 1862; nor has it since been seen here by others to our knowledge.

92. (131.) **Melospiza fasciata** (*Gm.*) *Scott.* (*M. melodia* of the original edition.) SONG SPARROW.

A permanent resident, extremely abundant, particularly in winter, at which season it is our commonest sparrow. During the inclement season it gathers in companies which seclude themselves in the shelter of intricate shrubbery, particularly in marshes and along the banks of the river and lesser streams. An occasional stave is heard from the melodious creatures even under these circumstances; and with the earliest breath of spring the rich and tender voices are heard in full song. This is one of the birds which holds its own best against the foreign Sparrows. It still breeds in numbers in the parks and private shrubberies throughout the city—in the Smithsonian Grounds, for instance—where a Song Sparrow seldom fails to salute us cheerily as we pass to and from our daily desk. [244]

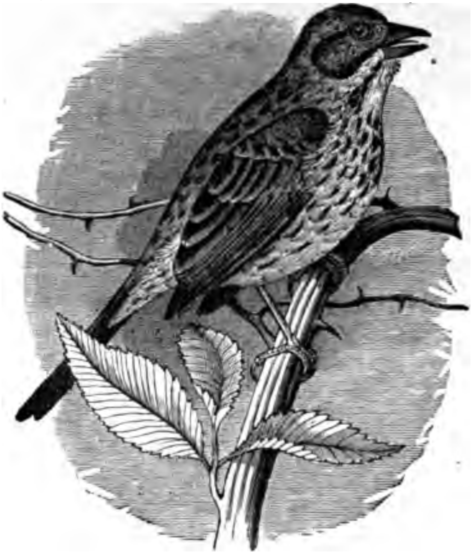


FIG. 36.—Song Sparrow.

93. (127.) **Junco hiemalis** (*Linn.*) *Scl.* SNOW-BIRD.

A winter resident. It arrives with the first cold snap, generally the 10th or 12th of October; soon becomes very numerous, and so continues until the 15th of April following. The main body of the birds then departs for the North or for the mountains to the west of us. It goes in flocks all the while it is with us, and comes into full song just before it leaves. In pleasant weather it retires to the woods, and keeps close in the shrubbery of thickets and ravines; but snow-storms send it trooping to our door-steps, even in the heart of the city. We still see it in the bits of ground about our K and N street houses, in the honeysuckle and wistaria vines, the climbing rose-bushes over the back porch, and the hibiscus shrub.

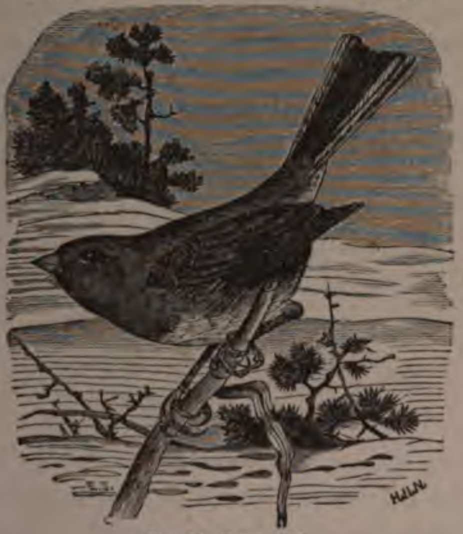


Fig. 37.—Snow-bird.

Many who suppose the Snow-bird to belong to the high north are surprised at the suddenness with which it appears and disappears according to the weather, wondering how it can accomplish the supposed long journey so quickly. But the bird breeds anywhere in what is known as the "Canadian Faunal Province," which, only coming down to sea level in the latitude of Middle New England, stretches south along the Appalachian chains to the Carolinas, and even Georgia. We have ourselves found the nest of the Snow bird *south* of the latitude of Washington, among the higher mountains of Virginia. Under these circumstances, it is, of course, only a matter of a day or two for the birds to visit us from their summer homes, and to retire on occasion to their mountain fastnesses. [261]

94. (128.) **Spizella monticola** (*Gm.*) *Bd.* TREE SPARROW.

With the exception of *Melospiza fasciata*, this is our most abundant winter Sparrow. It comes late from the North, usually not till the 1st of November, and is off, returning in the spring, about the 1st of April. It is a hardy, cheery little bird, enduring great cold without inconvenience, and singing its merry stave under the most dreary surroundings. It is almost always seen in flocks haunting the heart of the briar-patches and other most impenetrable shrubbery. In former years, when the "slashes" were in existence as a large marshy tract, north of N street, between Fourteenth and Twenty-first, now entirely built up, the birds could always be found in the thick bushes, between the dates above named. [268]

95. (129.) **Spizella domestica** (*Bartr.*) *Coues.* (*S. socialis* of the original edition.) CHIPPING SPARROW; CHIP-BIRD.

A summer resident, abundant, and half-domesticated, like the House Wren; breeds in orchards, gardens, shrubbery, and vines about houses, &c.; but a favorite site for the pretty hair-lined nest is the heart of a cedar-bush. Chippy comes betimes, usually the second week in March, and remains until October 10, when the Snow-birds usually make their appearance. [269]

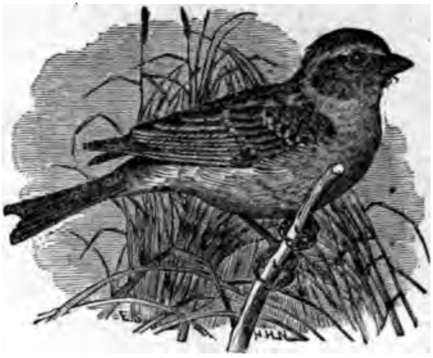


FIG. 38.—Chipping Sparrow.

96. (130.) **Spizella agrestis** (*Bartr.*) *Coues.* FIELD SPARROW. (*S. pusilla* of the original edition.)

Resident all the year round. This humble inhabitant of the bramble and briar is especially abundant in the spring time, less so in summer and autumn; and in the winter, when probably most individuals move south, is only found occasionally in secluded situations, such as shelter the Song Sparrows and the Tree Sparrows. Its sweet, simple song is occasionally heard in the fall, and very frequently during the spring months. The nest is placed in some low, isolated bush, briar, or weed-patch, in the field, quite close to the ground. One indivdual which we procured was a partial albino, patched here and there with pure white in the midst of normal coloration. [271]

97. (126.) **Zonotrichia albicollis** (*Gm.*) *Bp.* WHITE-THROATED SPARROW.

This large and handsome species is chiefly a spring and autumn migrant, but numbers spend the winter with us in sheltered places. It arrives early in October, and is extremely abundant during that month; then, after the winter decrease, it becomes very numerous again the 1st of April, and so continues until May 12, when it departs for its northern summer home. It is mostly gregarious while here, frequenting briar-patches, shrubbery, hedges, road-sides, and the like during the fall and winter, but as spring advances it is often seen in open woods upon the ground. Its well-known limpid song, which has given it the name of the "Peabody-bird" in some sections, is heard both in spring and fall, but especially during the former season. The White-throat is still to be seen, at periods of its greatest abundance, in the shrubbery of the city, particularly in the Smithsonian Grounds. [275]

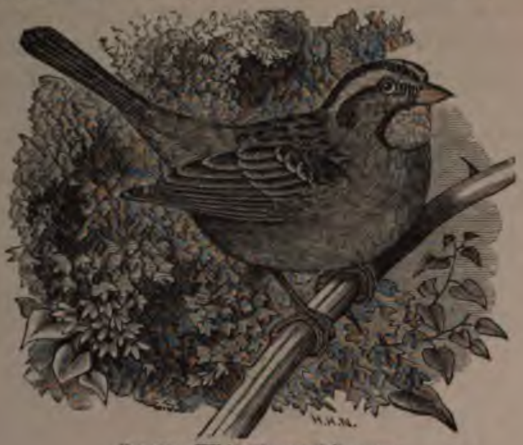


FIG. 39.—White-throated Sparrow.

98. (125.) **Zonotrichia leucophrys** (*Forst.*) *Sw.* WHITE-CROWNED SPARROW.

A winter resident, usually rare, occasionally quite plentiful, as, for example, in the spring of 1861, when we took many specimens in beautiful attire. It remains until the second week in May, when it moves off at the same time that the White-throats do. The time of arrival in the fall we never noted, but we presume it to be coincident with that of the White-throats. The resorts and habits of the two species are much the same. [276]

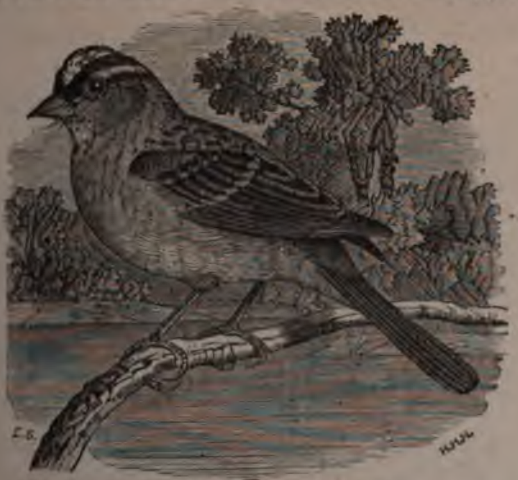


FIG. 40.—White-crowned Sparrow.

99. (—.) **Chondestes grammicus** (*Say*) *Bp.* LARK FINCH.

Not in the original edition; a straggler from the West, wholly beyond its normal range. An individual was observed in the Smithsonian Grounds by Mr. R. Ridgway, in the summer of 1877, and the same or another was also seen about the same time. Mr. Roberts shot a specimen on the Virginia side of Long Bridge, at Fort Runyon, August 25, 1877.

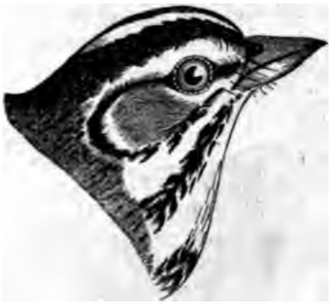


FIG. 41.—Head of Lark Finch, nat. size.

Mr. Roberts was in company with Mr. Jouy at the time, and this is the specimen upon the strength of which the species was entered in the Jouy catalogue. It is still in Mr. Roberts' possession. There appears to have been an eastward irruption of Lark Finches that year, other individuals having been taken elsewhere in the Atlantic States. [281]

100. (133.) **Passerella iliaca** (*Merr.*) *Sw.* FOX SPARROW.

Chiefly a spring and autumn migrant, though some spend the winter in sheltered localities; none breed here. It is abundant from November 1 to the 30th, and from March 1 to the 31st, but may be seen up to

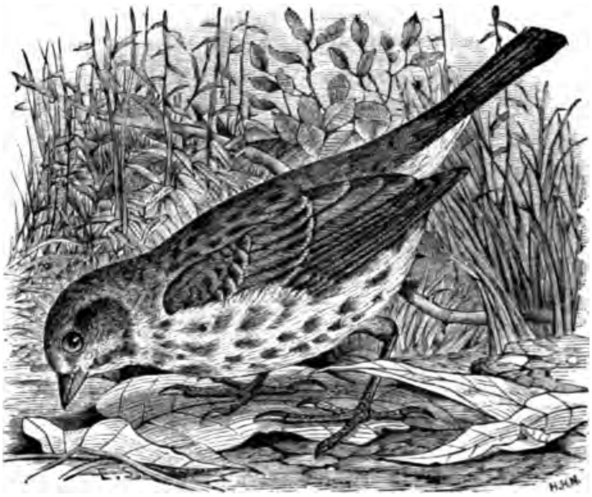


FIG. 42.—Fox Sparrow.

the middle of April. It is eminently gregarious, inhabiting thickets and the densest briar patches and laurel brakes. Like the Towhee Bunting, the Fox Sparrow spends much of its time on the ground, scratching and rustling among the dry leaves. It comes into full song just before it leaves, but at other times has only a slight chirp. [282]

101. (134.) **Spiza americana** (*Gm.*) *Bp.* BLACK-THROATED BUNTING.

A summer resident. This bird used to arrive regularly about the first of May, and leave toward the end of September, meanwhile being very abundant. We could always find it, for example, in the fields, orchards, and graveyards there formerly were along Fourteenth street between N street and Boundary. For several seasons one or more pairs bred regularly in the graveyard that occupied the second square south of the Boundary on the right hand going north, the *chip-chip-chee chee chee* of the males always saluting us as we passed to and from college. Now, however, the bird appears to have forsaken us, few if any having been heard of for the past few years. We can hardly account for this. The English Sparrows are scarcely numerous enough in the outskirts to have driven the Buntings away, nor need the building up of the city have caused them to retire from the whole District, as they appear to have done. Whatever the cause, it is one of the most notable changes in the bird-fauna of the immediate vicinity of the city. [287]

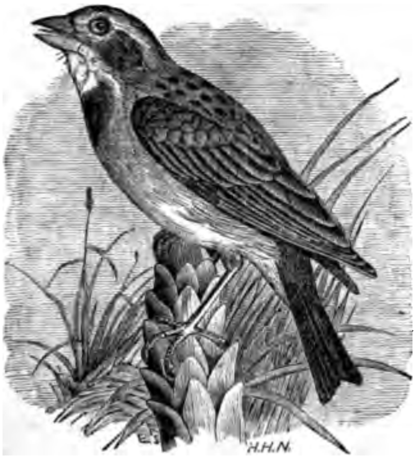


FIG. 43.—Black-throated Bunting.

102. (135.) **Zamelodia ludoviciana** (*Linn.*) *Coues.* ROSE-BREASTED GROSBEAK.

A rare summer visitant, seen at irregular intervals, and not to be procured every season. Its periods of appearance and disappearance we never noted. It doubtless breeds here, as we have known it to be taken in July. It is found chiefly in high open woods, where there is much undergrowth. During the carnival of 1882 the Rose-breasts were conspicuously abundant, and many entered the city, where perhaps none had ever been seen before. We observed several in the Smithsonian Grounds for a few days, with the Orioles and Tanagers. [289]

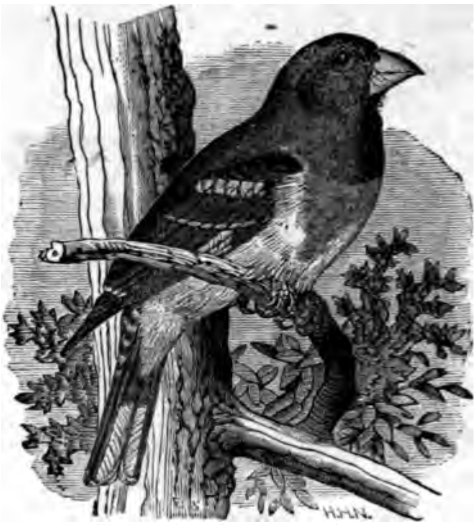


FIG. 44.—Rose-breasted Grosbeak.

103. (136.) **Guiraca cœrulea** (*Linn.*) *Sw.* BLUE GROSBEAK.

A summer resident, rather rare; arrives first week in May; departs about the middle of September. There used to be a bush clump on Boundary street, near the terminus of Twelfth, where a pair nested for several seasons—we think likely the very birds that Mr. John Burroughs speaks of in one of his charming books. Again, we used to find it breeding in one of the fields just west of the Old Soldiers' Home. It nests in much the same bush-clumps that a Cardinal might select, but at other times is found in more exposed situations, as orchards, open woods, the shade of roadsides, &c. [291]

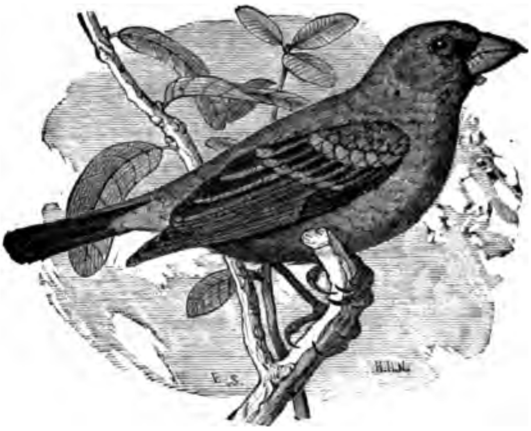


FIG. 45.—Blue Grosbeak.

104. (135.) **Passerina cyanea** (*Linn.*) *Gray.* INDIGO-BIRD.

A common summer resident, arriving the 1st of May and remaining until the second week in September, about orchards, meadows, and the edges of woods. It used to nest in the college grounds, and very likely does so still. [295]

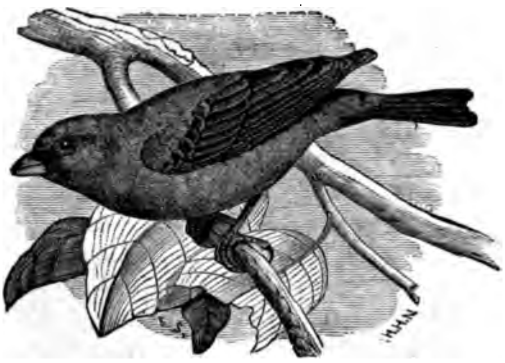


FIG. 46.—Indigo-bird.

105. (138.) **Cardinalis virginiana** *Bp.* CARDINAL GROSBEAK; VIRGINIA RED-BIRD.

Abundant all the year round, but it is shy and not easy to secure in the dense cover of the shrubbery which screens it from ordinary observation. The undergrowth along the Potomac between Chain Bridge and Little Falls and the choked ravines of Rock Creek are still its favorite resorts. [298]

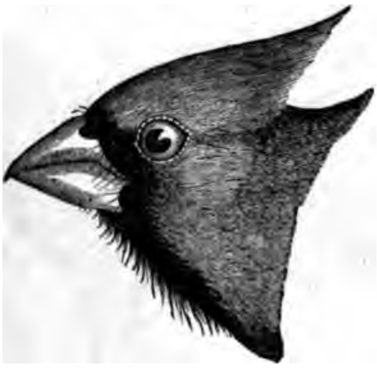


FIG. 47.—Head of Cardinal Grosbeak, nat. size.

106. (139.) **Pipilo erythrophthalmus** (*Linn.*) *Vieill.* TOWHEE BUNTING; "MARSH ROBIN."

Chiefly a spring and autumn migrant. A few breed with us, but none remain during the winter. It is abundant from April 25 to May 10, when most individuals pass north, and in the fall from the first to the third week in October. At the height of the seasons it seems partially gregarious, and it haunts at all times the thickest undergrowth along streams, the recesses of laurel brakes, and like sequestered spots, just such as the Cardinal loves. Much of its time is spent upon the ground scratching among fallen leaves. Its local name hereabouts is "Marsh Robin," the other being seldom, if ever, heard. [301]

Family ICTERIDÆ: Blackbirds, &c.

107. (140.) **Dolichonyx oryzivorus** (*Linn.*) *Sw.* Bobolink (in the spring); Reed-bird (in the fall).

A spring and autumn migrant, abundant. In the former season, the flocks on their way northward throw themselves into the fields and meadows, making their "mad music" and attracting general attention by their turbulency from the 1st to the 15th of May. They could always be depended upon, early in May, in the fields along Fourteenth street beyond N; and, though these are now built up, College Hill still receives the guests at the same season as formerly. In the spring of 1882, estopped like the rest of the migrants from passing northward, they "banked up" in the city parks, particularly the grounds about the White House; and very likely some of the cranks and quidnuncs which abound at the National Capital drew political augury from the unwonted babel of song. At this season the tawny females are inconspicuous, but the black-and-buff males have for the most part nearly finished their vernal tailoring, which they accomplish by dyeing their old suits without losing a feather. The familiar "clink" of the Reed-bird begins to be heard over the tracts of wild oats along the river banks about the 20th of August, and from that time until October the restaurants are all supplied with "Reed-birds"—luscious morsels when genuine; but a great many Blackbirds and English Sparrows are devoured by accomplished gourmands, who nevertheless do not know the difference when the bill of fare is printed correctly and the charges are sufficiently exorbitant. [312]

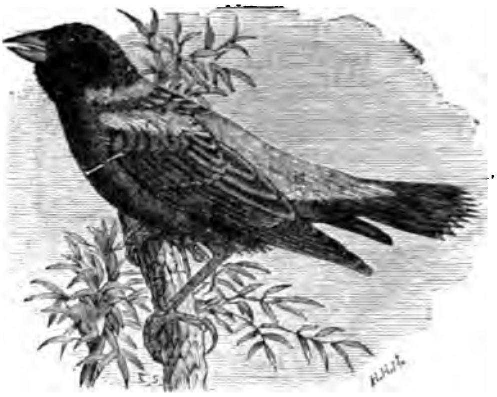


FIG. 48.—Bobolink.

108. (141.) **Molothrus ater** (*Bodd.*) *Gray.* (*M. pecoris* of the original edition.) COW-BIRD.

A summer resident; not very common. Arrives the second week in March; remains until October. It is probably less numerous, if not less generally distributed now than formerly, there being fewer cattle at large in the immediate vicinity of the city than there used to be twenty-five years ago in the streets and open lots—when Franklin Square, for instance, now an elegant little park, was a good cattle pasture, before it was turned into a military camp. [313]

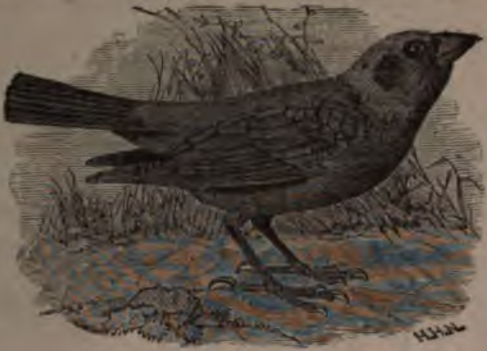


FIG. 49.—Cow-bird.

109. (142.) **Agelæus phœniceus** (*Linn.*) *Vieill.* RED-WINGED BLACKBIRD.

Resident nearly all the year, but more abundant during the migrations than at other seasons, and especially in the fall. Numbers breed in the marshes adjoining the Potomac and Anacostia Rivers. The Blackbirds begin to flock over the tracts of *Zizania aquatica* and the neighboring cornfields the first week in August, and by the latter part of that month they become a dusky host. Probably few, if any, pass the whole winter here. Their arrival from the South in small flocks may be noted early

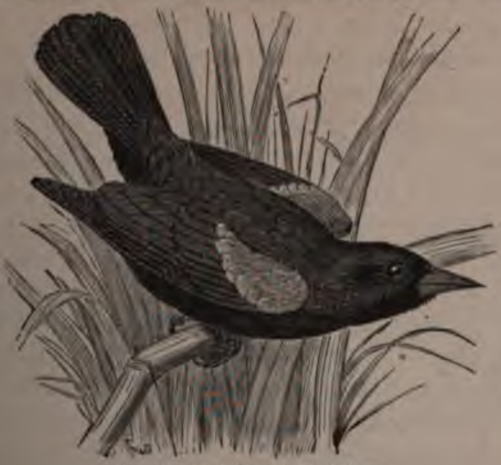


FIG. 50.—Red-winged Blackbird.

in March. The nest is a rude structure, placed in a bush or sapling, or clump of reeds or weeds, usually quite near the ground; the eggs are greenish, curiously limned in zigzag with dark lines, as well as marked with various purplish-brown spots. [316]

110. (143.) **Sturnella magna** (*Linn.*) *Sw.* Meadow Lark; Field Lark.

Resident all the year round, but less numerous in summer than at other seasons, as the greater number go farther north to breed. It inhabits exclusively fields and meadows, and has the habit of alighting on trees and fences surrounding the fields, as well as upon the ground.

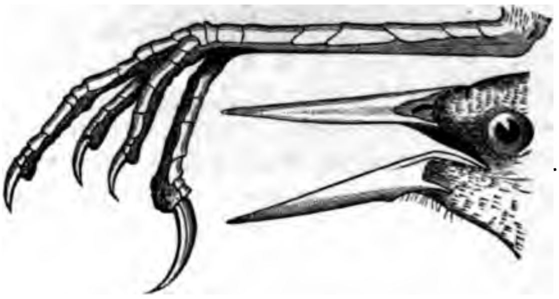


Fig. 51.—Bill and foot of Meadow Lark, nat. size.

In September it collects in flocks sometimes numbering hundreds of individuals, and is then shy and wary. It is considered "game" by youthful and other amateur sportsmen, and large numbers are destroyed for sport or for the table. The nest is a grassy ball upon the ground; the eggs are white, spotted with reddish. [320]

111. (145.) **Icterus spurius** (*Linn.*) *Bp.* Orchard Oriole.

A summer resident, not uncommon; arrives first week in May, and remains until the latter part of September, in high, open woods, orchards, parks, and meadows fringed with tall trees. Some always breed in the public grounds within the city. In the memorable spring of 1882, the Orchard Orioles were conspicuous beyond all the other birds for their numbers everywhere in the city. On the 15th of May, we saw in the Smithsonian Grounds a flock of at least a hundred, mixed with a few Baltimores, rambling over the ground in a new-mown grass plot—a very unwonted spectacle. Next after the political Bobolinks in the White House grounds, the Orchard Orioles probably attracted the most general attention. [324]

112. (144.) **Icterus galbula** (*Linn.*) *Coues.* (*I. baltimore* of the original edition.) Baltimore Oriole.

Chiefly a spring and autumn migrant, though many breed with us. They arrive the first week in May, and remain through the greater part of September. They frequent high, open woods, orchards, and parks, and some usually swing their grassy hammocks with the Orchard Orioles in the shade trees of the public grounds in the city. [326]

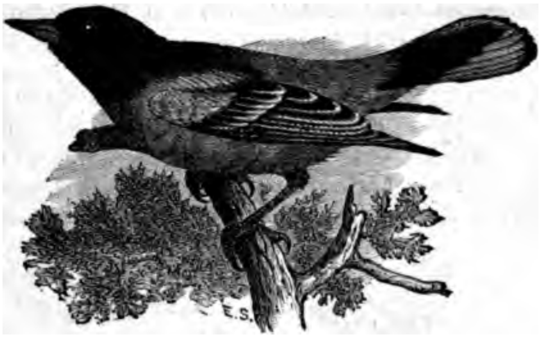


FIG. 52.—Baltimore Oriole.

113. (146.) **Scolecophagus ferrugineus** (*Gm.*) *Sw.* RUSTY GRACKLE.

An abundant winter resident. It arrives the third week in October, and remains until April, always in flocks, which frequent swampy localities, plowed fields, and other localities where food is abundant. The males are seldom, if ever, seen with us in full dress, this not being acquired till they reach their northern breeding grounds. [331]

114. (147.) **Quiscalus purpureus** (*Bartr.*) *Licht.* (*Q. versicolor* of the original edition.) CROW BLACKBIRD.

A summer resident; less abundant at that season than when flocking during the spring and fall migrations. We have not observed that any winter with us. These Blackbirds arrive in flocks about the 15th of March, and depart late in October. Soon after their advent, those that are to remain to breed begin their ludicrous courtships, which are a common spectacle in the Smithsonian Grounds, where several pairs usually nest in holes in the larger trees. [335]

115. (—.) **Quiscalus purpureus æneus** *Ridg.* BRONZED GRACKLE.

Not in the original edition; since described as a new variety by Mr. Ridgway. It occurs under the same circumstances as the last, the two forms, if they be really such, mixing freely together. In our remarks on the Jouy Catalogue we were indisposed to admit it, and we give it a place now with hesitation. Mr. Ridgway notes for us "several specimens seen," but considers it "rare." Mr. William Palmer notes one in his possession shot by Lewis McCormick at Falls Church, Va., and several obtained by Mr. Henry Marshall, at Laurel, Md. If we are not mistaken, we see the supposed species every spring in the Smithsonian Grounds. [336]

Family CORVIDÆ: Crows and Jays.

116. (148.) **Corvus frugivorus** *Bartr.* (*C. americanus* of the original edition.) COMMON CROW.

Resident all the year; found everywhere, and still abundant, particularly in winter; less so during the breeding season. Crows are not very noticeable during the summer, when scattered over the country nest in close woodland, but at other times no birds whatever are more frequently under observation. There is a famous "Crow roost" across the Potomac, some distance above the Chain Bridge, to which resort, during the greater part of the year, "the blackening train of Crows to their repose." Thousands of Crows from all parts of the country for many miles around go to and from the place daily. As it lies directly west of Washington, the consequence is that those beneath whose path the city lies are seen flying west in the evening and east in the morning. The latter flight occurs in the gray of the dawn, and of course is witnessed by few respectable persons, but the returning movement is conspicuous. It begins early in the afternoon and continues until dark. During all these hours a steady, ceaseless stream of the great black birds pours along—hundreds and thousands of them, not in flocks, but in a continuous train. On fair days they fly high and firmly; on windy days there is often much trouble, obliging the birds to tack and shift until they are sometimes so weary that they are forced to alight on the house-tops to gather strength to proceed. It happens that most of the strong winds, particularly the cold ones of February and March, come out of the west, thus directly opposing the progress of such birds as pass over the city. Such "roosts" are well known in various parts of the Eastern United States; but the impulse whose potency forces such long daily journeys upon the birds is a mystery as yet unexplained. Their scattering from the roost is of course in search of food, but the puzzle is why they should find it necessary to return every night when any other piece of woodland, one would suppose, should furnish equally eligible accommodations for the night. [340]

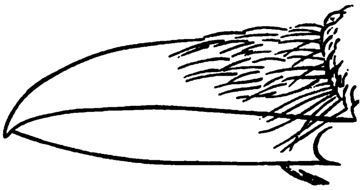


FIG. 53.—Bill of Crow, nat. size.

117. (149.) **Corvus maritimus** *Bartr.* (*C. ossifragus* of the original edition.) FISH CROW.

Resident all the year round; abundant, but less so than the foregoing. It is also less wary and suspicious, and more closely confined to the vicinity of the rivers. It is often confounded with the preceding; but some of the smallest and otherwise best-marked examples we have inspected have been those from this locality. [343]

NOTE.—In the Proceedings of the United States National Museum, 1880, p. 238, Mr. Ridgway records that a specimen of the European Rook, *Corvus frugilegus*, was seen by him in a maple tree on the grounds of the Agricultural Department in August, 1879. It was very tame, and flew laboriously, as if recently escaped from confinement. Nothing further has been learned of this estray.

(150.) **Cyanocitta cristata** (*Linn.*) *Strickl.* BLUE JAY; JAY-BIRD.

ident all the year, and abundant, especially in the autumn and r, when it is partially gregarious; found everywhere in woodland. [349]

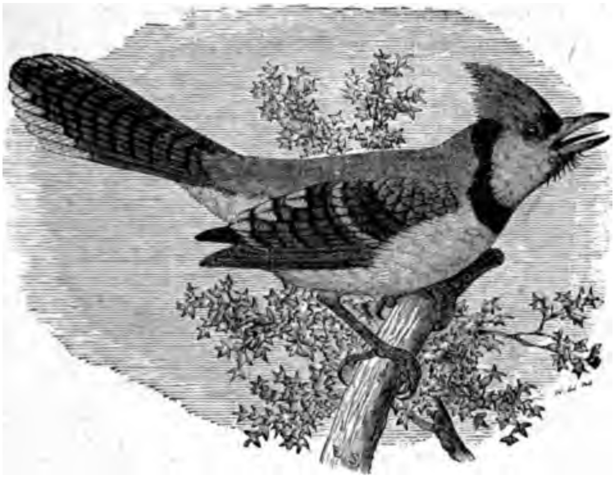


FIG. 54.—Blue Jay.

Suborder CLAMATORES: Songless Passeres.

Family TYRANNIDÆ: Flycatchers.

(34.) **Milvulus forficatus**? SWALLOW-TAILED FLYCATCHER.

Milvulus, probably *M. forficatus*, is given in the original edition as

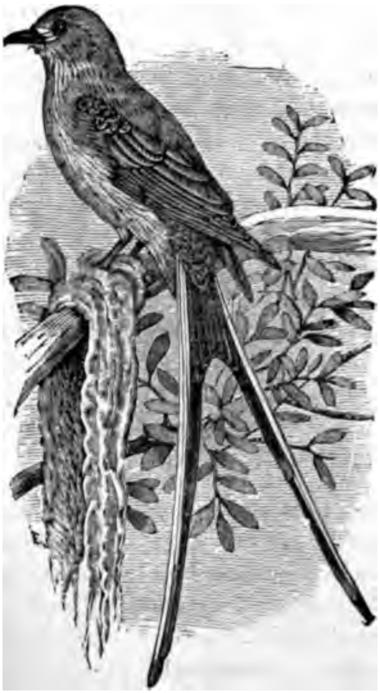


FIG. 55.—Swallow-tailed Flycatcher.

having been seen but not obtained by Mr. C. Drexler, May 6, 1861. We have never been satisfied of the accuracy of the information, even supposing veracity on the part of our informant; and in our remarks on Mr. Jouy's list we spoke as if inclined to drop the species from the list. But we have no more authority for so doing than for retaining it. So we make no alteration in a record which, unfortunately, must always remain dubious. This southwestern species has several times been taken straggling in the Atlantic States There is preserved in alcohol in the United States National Museum, No. 85,934, a specimen taken in Norfolk, Va., January 2, 1882, by Mr. R. B. Taylor. Of this occurrence we are informed through the attentions of Mr. Ridgway. (See also Bull. Nuttall Club, viii, 1883, p. 59.) [367]

120. (35.) **Tyrannus carolinensis** (*Linn.*) *Bd.* KING BIRD; "BEE MARTIN."

A common summer resident, arriving the second week in April and remaining until late in September. Though it breeds here plentifully, it is not so abundant under those circumstances as during the migration, since the greater number pass farther north in the spring and return in the fall. [368]

121. (—.) **Tyrannus verticalis** *Say.* ARKANSAW FLYCATCHER.

This is a western species added to the list in 1877 by Mr. Jouy, who found it in the flesh in market, September 30, 1874. In point of fact, it was not actually got in the District, but in some adjoining portion of Maryland. There is no doubt about the bird, as the specimen is preserved in the United States National Museum. (See Ann. Rep. Smiths. Inst. for 1874, 1875, p. 32, and Jouy's Catalogue, 1877, pp. 5 and 11 of the separate reprints from Field and Forest, vol. ii, 1877, pp. 154 and 178.) [370]

122. (36.) **Myiarchus crinitus** (*Linn.*) *Cab.* GREAT CRESTED FLYCATCHER.

A common summer resident, but more numerous during the migra-

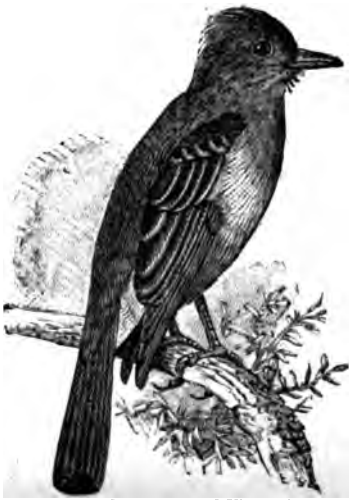


FIG. 58.—Great Crested Flycatcher.

tions in spring and fall. It arrives the third week in April and remains until the third week in September. In the spring it becomes conspicuous through the vehement reiteration of its loud, harsh, and altogether peculiar notes, somewhat resembling the cry of the tree-frog, repeated for an hour at a time with intervals of a few minutes whilst the bird is upon its perch in the top of a tree. Unlike most flycatchers, it nests in holes, uses the slough of snakes in the construction of its nest, and lays very singularly-marked eggs. [373]

123. (37.) **Sayiornis fusca** (*Gm.*) *Bd.* PEWIT FLYCATCHER; "PHŒBE-BIRD;" "TOM-TIT."

A common summer resident, but more plentiful in spring and fall, since the greater number pass further north to breed. This is the *first* of the spring visitors, arriving before the Swallows and Bluebirds, about the 1st of March. It is very abundant for a month or six weeks, and again in the fall from the latter part of September until the third week in October. It is not specially a woodland bird, like the *Contopus*, being often found out in weedy fields, by the roadsides, in ravines; and breeds in caves, about rocks, creeks, and bridges, as well as in out-houses. The very pretty nest, stuccoed with mosses, is affixed by the mud composing it to the side of some vertical support; the eggs are white, normally unmarked. [379]

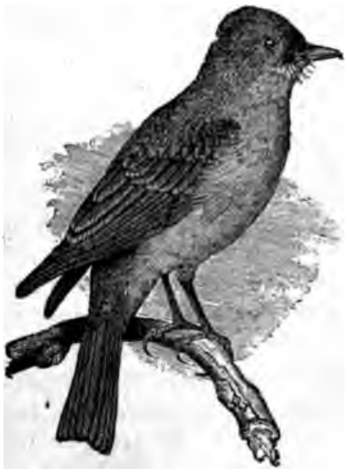


FIG. 57.—Pewit Flycatcher.

124. (38.) **Contopus virens** (*Linn.*) *Cab.* WOOD PEWEE.

A summer resident, extremely abundant in all the woodland. It arrives the last week in April, becomes numerous in about two weeks, and remains until the third week in September. One can hardly enter a piece of woods without being saluted with its plaintive, droning notes; and some individuals regularly nest in the parks within city limits.

The nest, however, is not easily discovered, being a mossy saucer-like structure saddled so closely on the bough as to appear like a natural excrescence. The eggs are three or four in number, creamy-white, speckled with reddish. [382]

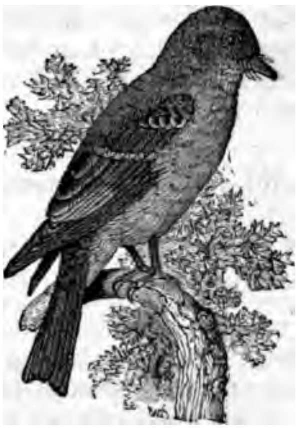


FIG. 58.—Wood Pewee.

125. (39.) **Empidonax acadicus** (*Gm.*) *Bd.* ACADIAN FLYCATCHER.

A common summer resident; the most abundant of the ***Empidonaces***, and the only one *known* to breed here. It arrives the last week in April, and leaves about September 25. The eggs closely resemble those of the Pewee, but the nest is placed partly pendant in a forked twig. [384]

126. (40.) **Empidonax trailli** (*Aud.*) *Bd.* TRAILL'S FLYCATCHER.

Rare; during the breeding season at any rate it is seldom if ever observed, and we do not think we satisfactorily identified it under those circumstances. It is, however, not so uncommon as our remarks in the original edition would indicate, as we did not sufficiently discriminate between it and some of its congeners. It is found in woodland, and its times of arrival and departure are probably the same as those of the next species. [385]

127. (41.) **Empidonax minimus** *Bd.* LEAST FLYCATCHER.

Spring and autumn migrant; does not breed here; rather common, most so during the vernal migration. It arrives the last week in April, and is seen for about two weeks; returns the third week in August, and remains until the third week in September. It is not a woodland bird, frequenting exclusively the margins of small streams, briar-patches, hedge-rows, and similar resorts. [387]

128. (42.) **Empidonax flaviventris** *Bd.* YELLOW-BELLIED FLYCATCHER.

Spring and autumn migrant, rather rare. Having taken it July 28, we were led to suppose it might breed here, and so expressed ourselves in the original edition. But, with larger experience with this difficult

10. *Ammodramus caudacutus.* In one known instance, September, 1862.
11. *Chondestes grammicus.* One or two instances, summer of 1877.
12. *Milvulus forficatus?* In one alleged instance, May 6, 1861.
13. *Tyrannus verticalis.* In one known instance, September 20, 1874.
14. *Nyctea scandiaca.* Irregular; from the north in severe winters.
15. *Falco peregrinus.* Casual; in one known instance, December, 1878.
16. *Astur atricapillus.* Irregular; from the north in severe winters.
17. *Archibuteo lagopus sancti-johannis.* In one known instance, December 29, 1879.
18. *Chamæpelia passerina.* In one known instance, many years ago.
19. *Ægialitis semipalmatus.* Casual, in migration.
20. *Macrorhamphus griseus.* Casual, in migration.
21. *Ereunetes pusillus.* Casual, in migration.
22. *Florida cærulea.* Occasional; from the south in late summer.
23. *Grus pratensis.* In one known instance. (Doubtless extirpated.)
24. *Rallus longirostris crepitans.* In one known instance, September 8, 1882.
25. *Porzana jamaicensis.* In one known instance, September, 1861.
26. *Gallinula galeata.* Occasional; chiefly in the fall.
27. *Mareca penelope.* In one instance, in market, from Alexandria, Va., spring of 1863.
28. *Harelda glacialis.* Casual, from salt water.
29. *Œdemia americana.* Casual, from salt water.
30. *Œdemia fusca.* Casual, from salt water.
31. *Œdemia perspicillata.* Casual, from salt water.
32. *Phalacrocorax dilophus.* In one instance, many years ago.
33. *Chroicocephalus atricilla.* Occasional, in summer.
34. *Sterna anglica.* Occasional, in migration.
35. *Sterna forsteri.* Occasional, in migration.
36. *Sterna hirundo.* Occasional, in migration.
37. *Rhynchops nigra.* In one known instance, September 8, 1858.
38. *Cymochorea leucorrhoa.* On one occasion, many years ago.
39. *Oceanites oceanicus.* In one known instance, many years ago.
40. *Puffinus obscurus?* In one known instance, many years ago.

There were 25 species in this category in the original edition, of which one (*Colymbus torquatus*) has been transferred to category B, and to which 16 species have been added. It is seen that of the total 23 species which have been found in the District since 1862, 16 are merely accidental or very rare visitors.

always breed in the chimneys of the Smithsonian, the White House, and other public buildings. There is an old residence in Georgetown the chimneys of which, one year at least, were used by hundreds if not thousands of the Swifts as a nightly resort; into which we have seen them streaming toward nightfall. [405]

Family TROCHILIDÆ: Humming-birds.

132. (29.) **Trochilus colubris** *Linn.* RUBY-THROATED HUMMING-BIRD.

A summer resident; the only member of the family found here. Some suppose there are different species of Humming-birds in the Eastern United States, but this is a mistake. The Ruby-throat is abundant, especially early in the fall. It arrives in spring about May 1, and remains until the first approach of cold weather. It is frequently seen in the parks and gardens of the city, and in the surrounding country in patches of wild flowers growing along the little streams. The catalpas in the White House Grounds attract large numbers when in bloom. [409]

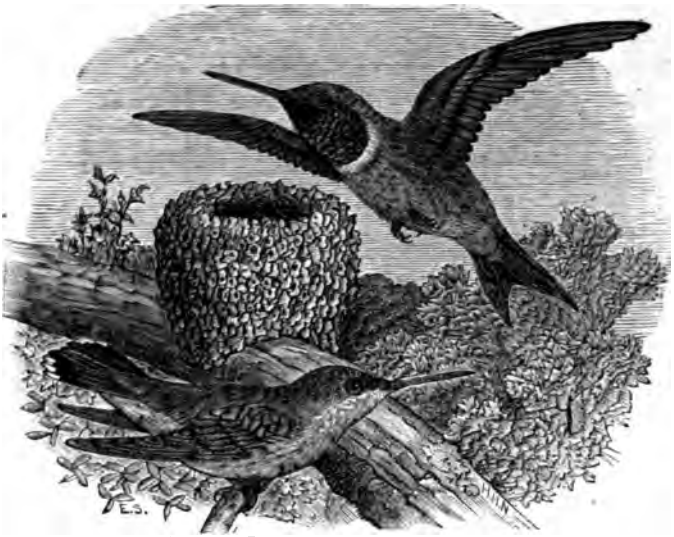


FIG. 60.—Ruby-throated Humming-bird.

Suborder CUCULIFORMES: Cuculiform Birds.

Family ALCEDINIDÆ: Kingfishers.

133. (33.) **Ceryle alcyon** (*Linn.*) *Boie.* BELTED KINGFISHER.

A summer resident, and still not uncommon along the rivers and Rock Creek. It is nearly permanent, only forced southward by the freezing of the waters; but its arrival, or, at any rate, its increase in numbers, may be noted late in March, and the opposite circumstances early in October. [423]

VI.—GAME LAWS OF THE DISTRICT.

[PUBLIC—NO. 99.]

AN ACT for the preservation of game and protection of birds in the District of Columbia.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That no person shall kill or expose for sale, or have in either his or her possession, either dead or alive, any partridge, otherwise quail, between the first day of February and the first day of November, under a penalty of five dollars for each bird so killed or in possession.

SEC. 2. That no person shall kill or expose for sale, or have in his or her possession, either dead or alive, any pheasant, otherwise ruffed grouse, between the first day of February and the first day of August, under a penalty of five dollars for each bird so killed or in possession.

SEC. 3. That no person shall kill or expose for sale, or have in his or her possession, either dead or alive, any woodcock, between the first day of February and the first day of July, under a penalty of five dollars for each bird so killed or in possession.

SEC. 4. That no person shall kill or expose for sale, or have in his or her possession, either dead or alive, any prairie chicken, otherwise pinnated grouse, between the first day of February and the first day of September, under a penalty of five dollars for each bird so killed or in possession.

SEC. 5. That no person shall kill or expose for sale, or have in his or her possession, either dead or alive, any snipe, or plover, between the first day of May and the first day of September, under a penalty of five dollars for each bird so killed or in possession.

SEC. 6. That no person shall kill or expose for sale, or have in his or her possession, either dead or alive, any wild duck, wild goose, or wild brant, between the first day of April and the first day of September, under a penalty of five dollars for each bird so killed or in possession.

SEC. 7. That no person shall kill or expose for sale, or have in his or her possession, either dead or alive, any water-rail, or ortolan, or reed-bird, or rice-bird, between the first day of February and the first day of September, under a penalty of two dollars for each bird so killed or in possession.

SEC. 8. That no person shall expose for sale or have in his or her possession, any deer-meat, or venison, between the first day of January and the fifteenth day of August, under a penalty of twenty cents for each and every pound of deer-meat so exposed for sale or had in possession.

one in the fall of 1880 at Falls Church, and has three specimens, bought in market on the 9th of January, 1879, which had been shot in Maryland near the District line. [432]

137. (22.) **Picus villosus** *Linn.* HAIRY WOODPECKER.

A permanent resident, but rare, and becoming more so as the timber disappears. It was not at all common even twenty-five years ago. [438]

138. (23.) **Picus pubescens** (*Linn.*) DOWNY WOODPECKER.

A permanent resident; formerly very abundant indeed, and still common. Now and then one still appears in the orchards and gardens, where there are trees, within the city limits; and plenty of fruit trees riddled with the borings of the indefatigable "Sapsuckers" (as they are wrongly called) are still standing in our midst. [440]

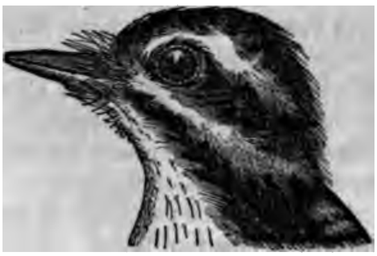


FIG. 62.—Head of Downy Woodpecker, nat. size.

139. (24.) **Sphyropicus varius** (*Linn.*) *Bd.* YELLOW-BELLIED WOODPECKER; "SAPSUCKER." (Properly so called.)

A permanent resident; abundant, particularly in the fall. Frequents chiefly high open woods, but often seen in thickets and tangle. It is fond erries and other fruits, particularly those of the sour gum. [446]

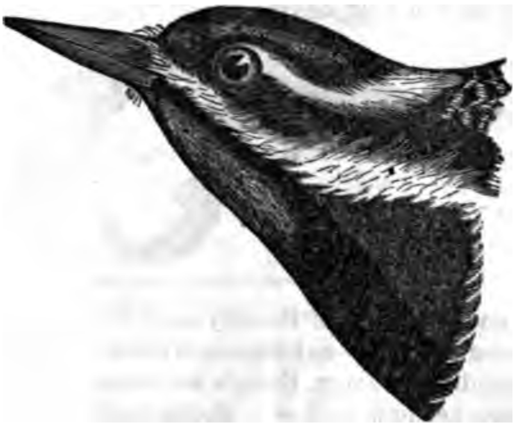


FIG. 63.—Head of Yellow-bellied Woodpecker.

0. (26.) **Centurus carolinus** (*Linn.*) *Bp.* RED-BELLIED WOODPECKER.
A permanent resident; rare, and apparently becoming more so. [450]

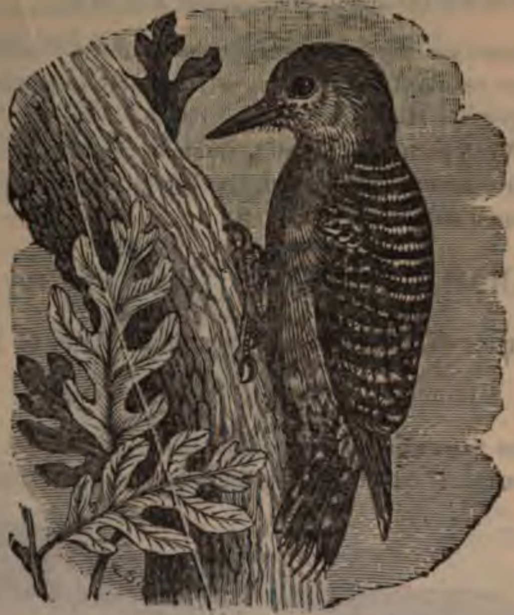


FIG. 64.—Red-bellied Woodpecker.

1. (27.) **Melanerpes eythrocephalus** (*Linn.*) *Sw.* RED-HEADED WOODPECKER.
A summer resident in high open woods. This is still probably the st abundant species of the family, holding its own with perfect good

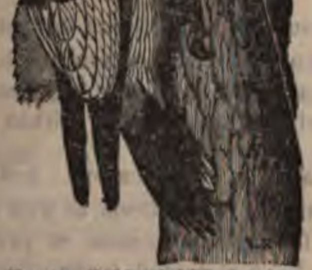


FIG. 65.—Red-headed Woodpecker.

ure and careless familiarity. It is the most decidedly migratory of though irregular and no more to be depended upon in its movements than in any other of the actions which indicate its versatile disposition. It commonly arrives late in April, and remains until the middle of September; but it is too erratic to come under any rule. [453]

142. (28.) **Colaptes auratus** (*Linn.*) *Sw.* Golden-winged Woodpecker.

A permanent resident; abundant, particularly in spring and fall, as there is an imperfect migration of the species. [457]

Note.—A West Indian Paroquet, *Conurus xanthogenys* Bp. was shot by us in a grove near Washington, in the spring of 1860. It was of course an escaped cage bird.

Order RAPTORES: Birds of Prey.

Suborder STRIGES: Nocturnal Birds of Prey.

Family ALUCONIDÆ: Barn Owls.

143. (—.) **Aluco flammeus pratincola** (*Bp.*) *Coues.* Barn Owl.

Not in the original edition, as we had not at that time observed it.

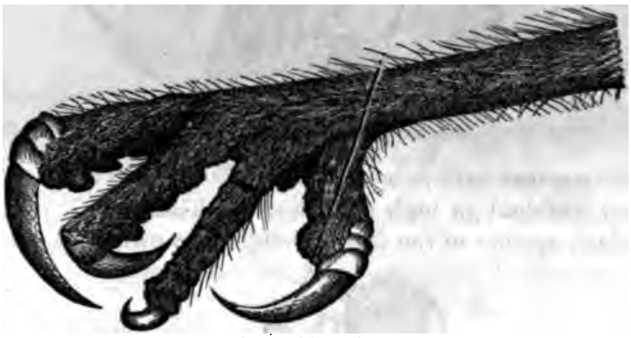


Fig. 65.—Foot of Barn Owl, nat. size.

Added to the list by Jouy, in 1877. It is occasionally seen or heard in the city, and is known to have nested in the Smithsonian towers. Resident. [461]

Family STRIGIDÆ: Owls.

144. (15.) **Bubo virginianus** (*Gm.*) *Bp.* Great Horned Owl; "Cat Owl."

This large species has never been common, and has doubtless decreased in numbers of late years. It is sometimes found in market, having been taken in the vicinity, if not actually within the District. [462]

145. (14.) **Scops asio** (*Linn.*) *Bp.* Screech Owl; Red Owl; Mottled Owl.

This is the most abundant of the Owls, as well as the smallest species known to occur here, for *Nyctala acadica*, of probable occurrence, has not to our knowledge been detected in the District. The Scops owl breeds here, and is a permanent resident. Eggs and nestlings may always be found about Georgetown College in due season. [465]

146. (16.) **Asio wilsonianus** (*Less.*) *Coues.* LONG-EARED OWL.

More abundant than the Cat Owl, less so than the preceding species. It is seldom seen, however, as it passes the daytime in hollow trees, thick clumps of pines, and similar dusky resorts. Resident. [472]

147. (17.) **Asio accipitrinus** (*Pall.*) *Newt.* (*Brachyotus cassini* of the original edition.) SHORT-EARED OWL.

Resident; abundant. It has been taken in the streets of the city. [473]

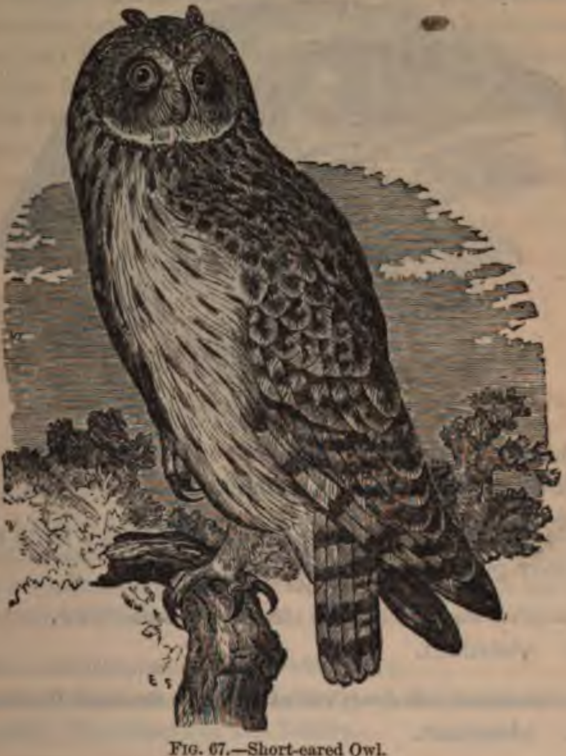


FIG. 67.—Short-eared Owl.

148. (18.) **Strix nebulosa** (*Forst.*) BARRED OWL.

Resident; rare, and seldom observed. In the day-time it is to be found chiefly in close cedar thickets, near farm-houses. [476]

149. (19.) **Nyctea scandiaca** (*Linn.*) *Newt.* SNOWY OWL.

A rare straggler, only occasionally visiting us in severe winter weather. It does not appear to ordinarily come south of Philadelphia, where it occurs probably every winter. [479]

Suborder ACCIPITRES: Diurnal Birds of Prey.

Family FALCONIDÆ: Hawks and Eagles.

150. (10.) **Circus cyaneus hudsonius** (*Linn.*) *Coues*. MARSH HAWK.

Resident. Abundant. This is one of the commonest Hawks, generally seen over the marshes along the rivers; formerly in the "slashes" and other wet places in the northern part of the city. It is one of the species most frequently exposed for sale in the markets. [489]

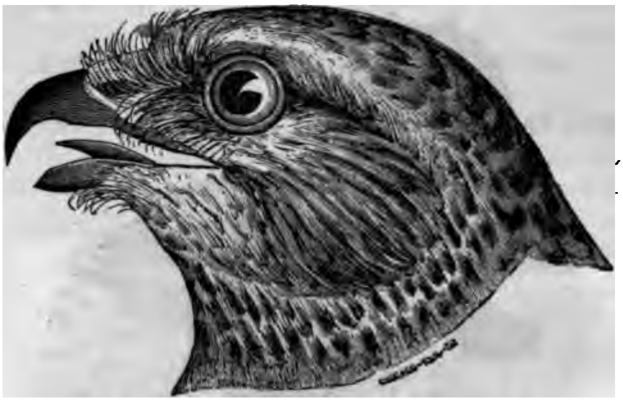


FIG. 68.—Head of Marsh Hawk, nat. size.

The Swallow-tailed Kite, *Elanoides forficatus*, is a wide ranging species, which may pay us a flying visit at any time.

151. (6.) **Accipiter fuscus** (*Gm.*) *Bp*. SHARP-SHINNED HAWK.

Resident. Abundant. [494]

152. (5.) **Accipiter cooperi** *Bp*. COOPER'S HAWK; CHICKEN HAWK.

Resident. Abundant. [495]

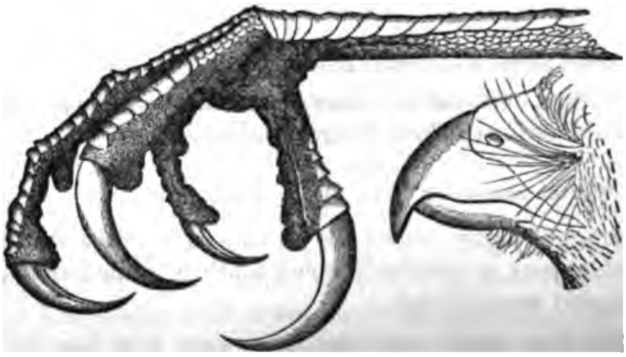


FIG. 69.—Bill and foot of Cooper's Hawk, nat. size.

153. (4.) **Astur atricapillus** (*Wils.*) *Bp.* GOSHAWK.

Very rare; only occasionally observed during the winter months. [496]

154. (—.) **Falco peregrinus** *Tunstall.* PEREGRINE FALCON; DUCK HAWK.

Very rare and only casual. We are informed by Mr. George Shoemaker that a Duck Hawk was seen upon the river in winter some years ago. On inquiring further into this case, Mr. William Palmer, who saw the bird, gave us the following account: As he was skating on the river just above Long Bridge, one morning in December, 1878, he observed a number of Ducks upon some open water, towards which a man was pushing a skiff over the ice. At his shot, a Duck which had been wounded rose and flew along a few feet over the ice. Mr. Palmer started in pursuit, but had not gone far before he observed a Duck Hawk flying along only about 20 yards overhead. Both man and hawk continued along in this manner for some 300 yards, when the wounded Duck fell upon the ice and was secured, while the disappointed Hawk soared away. The Hawk was so near it could easily have been shot had Mr. Palmer had a gun, and the identification was perfectly satisfactory. Mr. Palmer adds, on the strength of information received from Mr. Jouy, that the Duck Hawk has been known to breed at Harper's Ferry, Va. [503]

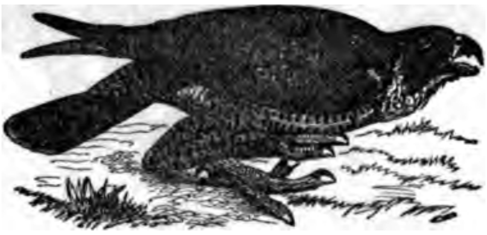


FIG. 70.—Peregrine Falcon.

155. (2.) **Falco columbarius** *Linn.* PIGEON HAWK.

Rather rare, and seldom observed, but probably resident. Sometimes found in market, like others of the family. [505]

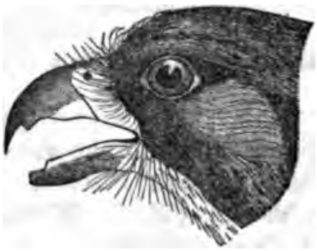


FIG. 71.—Head of Sparrow Hawk.

156. (3.) **Falco sparverius** *Linn.* SPARROW HAWK.

Resident. Abundant. It is known to have nested in the Smithsonian. [508]

157. (7.) **Buteo borealis** (*Gm.*) *Vieill.* Red-tailed Buzzard; Hen Hawk.

Resident. Abundant, especially in the winter months. It is a wild and wary bird, generally seen solitary or in pairs, in open country, perched upon some large tree commanding a view of its preserves; sometimes noticed sailing or circling high over the city. [516]

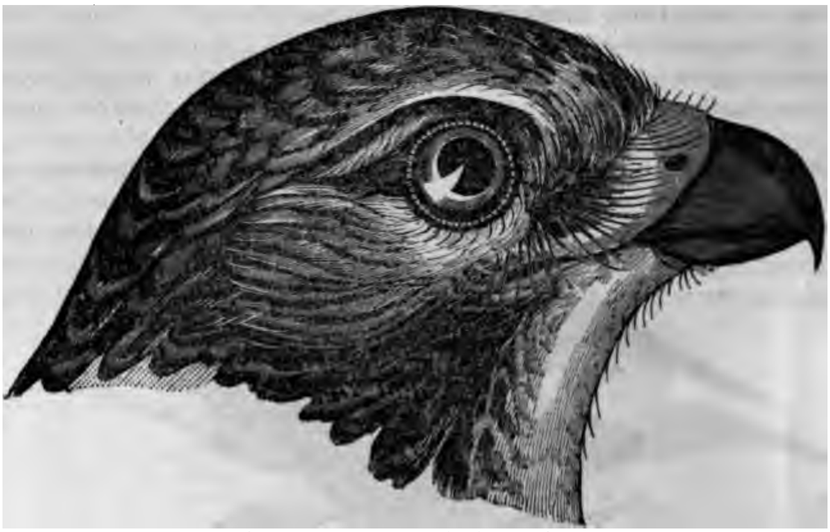


FIG. 72.—Head of Hen Hawk, nat. size.

158. (8.) **Buteo lineatus** (*Gm.*) *Jard.* Red-shouldered Buzzard; "Chicken Hawk."

A common species, doubtless resident, but chiefly observed in winter, under the circumstances noted for the preceding species. [520]

159. (9.) **Buteo pennsylvanicus** (*Wils.*) *Bp.* Broad-winged Buzzard; "Chicken Hawk."

Rare; probably resident, but only occasionally observed. Specimens of this and the two preceding species may be found in the markets pretty regularly, especially during the winter months. Nos. 157 and 158 are the commonest of the large *Falconidæ*. [524]

160. (—.) **Archibuteo lagopus sancti-johannis** (*Gm.*) *Ridg.* Rough-legged Hawk.

Not in the original edition, as we had no positive authority for including it, though we were satisfied that so widely distributed a bird could not be an entire stranger to the District. One was lately seen here by the well-known ornithologist, Mr. H. W. Henshaw, under circumstances which left no doubt of the identification, although the bird was not secured.

Mr. Henshaw writes to us: "I saw the Rough-leg December 29, 1879, on the Virginia shore, just opposite the city, skirting the edge of a marsh, perhaps in search of wounded ducks. Probably with a view of getting a better look at me, he swept in near enough to receive two charges of No. 8; whereupon, not relishing the warmth of his reception, he dropped his legs down in a most feeling manner and departed. The range was long for No. 8, but close enough to certify my identification of the bird (and doubtless his of me)." [525]

161. (11.) **Aquila chrysaëtus** (*Linn.*) *Cuv.* GOLDEN EAGLE.

Apparently not rare, for an Eagle, individuals being observed or taken nearly every winter. Two specimens from this locality are preserved in the Smithsonian. [532]

162. (12.) **Haliaëtus leucocephalus** (*Linn.*) *Savig.* BALD EAGLE; WHITE-HEADED EAGLE.

Resident, and not rare. It is frequently observed sailing over the river, or perched upon some stub or snag on the flats. We have not seldom seen it soaring over the city—the last time in May, 1882. [534]

FIG. 73.—Bald Eagle.

Family PANDIONIDÆ: Fish Hawks.

163. (13.) **Pandion haliaëtus** (*Linn.*) *Savig.* FISH HAWK; OSPREY.

Common; migratory. We do not know of any nests within the District, but have seen them lower down the river; the species properly belongs to the category of summer residents. It is often seen sailing over the Potomac and Anacostia Rivers, or perched upon the branches of dead trees overhanging their banks. Its migrations correspond to some extent with those of the fish upon which it feeds, and it consequently appears in spring about the time the fishing season begins. [530]

Suborder CATHARTIDES: American Vultures.

Family CATHARTIDÆ: American Vultures.

164. (1.) **Cathartes aura** (*Linn.*) *Ill.* TURKEY BUZZARD.

A permanent resident, and still common, though less abundant than formerly, when the arrangements for the disposition of carrion were more primitive than they now are. The "slashes" in the northern part of the city, between Fourteenth and Twenty-first streets, were twenty years ago the place of deposit of dead horses and other animals, and in the same vicinity there were various dumping spots for the night-soil, which used to be carted about the streets in the most primitive manner. Such attractions, of course, held the carrion birds in large numbers. They are still to be seen any day sailing over the city.

The Turkey Buzzard will "play 'possum" on occasion. One day in 1859, when we were out shooting, we winged a Turkey Buzzard, which dropped at the shot, and as we approached was found standing under a laurel bush, with one wing hanging. Having disgorged the contents of his crop, which consisted of portions of some new-born pigs he had just devoured, without frightening off the enemy, he then drooped his head slowly and gradually fell over on one side, apparently dead. He was picked up in this *feinting* condition, supposed to be dead, thrust with difficulty into a game-bag, and carried home, a distance of two miles. He was then pulled out of the bag and thrown down in the back yard—all this while manifesting no sign of animation. But when we next saw him, a few minutes later, he was walking about the yard—not exactly "a-laughing," like Mother Hubbard's dog on the return of that dame, but still quite lively. On our approach he simulated death as before, and and trick was repeated again and again, until, finding that the deception no longer deceived, he screwed up his courage and tried different tactics, menacing and hissing somewhat like a goose when we approached. He was finally dispatched, however, by our joint efforts, and his musty hide and feathers deposited in our youth's museum.

Similar strategy on the part of the Turkey Buzzard in Arizona is noted in Dr. Coues' "Birds of the Northwest," p. 383. [537]

Order COLUMBÆ: Columbine Birds.

Suborder PERISTERÆ: Pigeons.

Family COLUMBIDÆ: Pigeons.

165. (151.) **Ectopistes migratorius** (*Linn.*) *Sw.* PASSENGER PIGEON.

Makes its appearance in flocks at irregular intervals throughout the fall, winter, and spring months. We have shot specimens so young as to permit the inference that they were hatched in the vicinity; but if so, it was probably an unusual occurrence. Pigeons are certainly rare and very irregular here now. The last large flight we remember took place in the fall more than twenty years ago—we think about 1858 or 1859. [543]

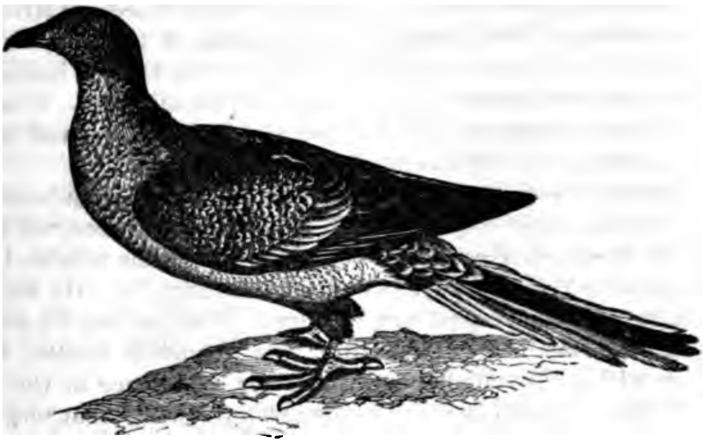


FIG. 74.—Passenger Pigeon.

166. (152.) **Zenaidura carolinensis** (*Linn.*) *Bp.* CAROLINA TURTLE DOVE; MOURNING DOVE.

A permanent resident; not very abundant. Sometimes, however, the Doves collect in large flocks in the fall, when they frequent corn and buckwheat fields. The latter may always be relied upon to furnish Doves at that season. [544]

167. (153.) **Chamæpelia passerina** (*Linn.*) *Sw.* GROUND DOVE.

An entirely accidental visitor from the South in one known instance. The specimen is preserved in the Smithsonian. [547]

Order GALLINÆ: Gallinaceous Birds.

Suborder ALECTOROPODES: Fowl.

Family MELEAGRIDIDÆ: Turkeys.

168. (154.) **Meleagris gallipavo americana** (*Bartr.*) *Coues.* WILD TURKEY.

In the original edition we remarked of the Wild Turkey: "Regularly seen in the markets all through the winter, though not often found in the immediate vicinity of the city. Remains all the year in the neighboring districts."

In our "Remarks" upon Mr. Jouy's list we added, in 1877, speaking of birds to be subtracted from our list: "Another is *Meleagrus gallipavo.* It may have been proper to introduce the bird in 1861, but we doubt that a live Wild Turkey has been in the District or immediate vicinity for several years, though the birds are constantly brought from surrounding country to the city for sale."

T[illegible] these circumstances, it might seem proper to place the Turkey [illegible] retired list." But on further investigation we have satisfied ourselves of the propriety of retaining it among actual inhabitants of the District.

In a note addressed to us, Mr. William Palmer states: "Mr. Howard Abbott shot two Wild Turkeys in the winter of 1881–'82, near Falls Church, Va. Mr. Hardin, of Georgetown, told me that he had shot two the same winter between Georgetown and Tennallytown. I have also known of several others secured within sight of the city, and have myself found feathers when hunting in this vicinity."

Mr. George Shoemaker, of the Smithsonian, says in substance in a communication dated September 23, 1882: "A letter received from my friend Mr. Henry C. Wood, of Georgetown, gives some reliable information respecting Wild Turkeys in and near the District. He says he has seen them within the past six or seven years on the Virginia hills between the 'Dam' and 'Dead Run,' has frequently tracked them in the snow within these limits, and that their occurrence in the vicinity of Dead Run is known to every hunter who frequents that picturesque locality. Mr. Albert Thompson, a friend of Mr. Wood's and a skillful sportsman, appended to Mr. Wood's letter his corroboration of the statement that Wild Turkeys are to be found in the vicinity of Dead Run, where he has himself frequently seen them during the past few years. The 'Dam' referred to is the one just beyond High Island, certainly not more than half a mile above the District line. The whole range of hills on the Virginia side of the river, from Chain Bridge to and beyond Great Falls, is thickly wooded, and in places so extremely wild and rugged that I have seldom gone far above the Dam without seeing some Ruffed Grouse or hearing their 'drumming.' Mr. William C. Hazel, of Georgetown, is in the habit of pasturing his horses at a friend's farm on the Georgetown and Leesburg turnpike road, nine miles beyond Chain Bridge. He informs me that he has shot a number of Wild Turkeys in the woods between this farm and the river, where they could almost certainly be found at any season." [554]

Family TETRAONIDÆ: Grouse.

169. (155.) **Bonasa umbella.** (*Linn.*) *Steph.* RUFFED GROUSE; "PHEASANT."

Resident all the year round, but not common. They are always in

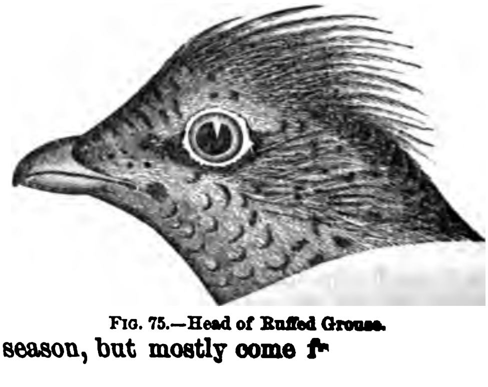


FIG. 75.—Head of Ruffed Grouse.

the market in season, but mostly come f
District.

- **Sparrow,** Savanna, 59
  - Song, 62
  - Swamp, 61
  - Tree, 63
  - White-crowned, 65
  - White-throated, 64
  - Yellow-winged, 60
- **Spatula** clypeata, 10, 104
- **Species** not in list, 118
- **Sphyropicus** varius, 82
- **Spiza** americana, 67
- **Spizella** agrestis, 64
  - domestica, 64
  - monticola, 63
- Spotted Sandpiper, 11, 97
- Sprig-tail, 103
- Spring and Fall, migrants only in, 115
- Stake-driver, 100
- Steganopodes, 108
- **Stelgidopteryx** serripennis, 53
- **Sterna** anglica, 106
  - aranea, 108
  - forsteri, 10, 109
  - frenata, 109
  - hirundo, 109
  - superciliaris antillarum, 109
- Striges, 84
- Strigidæ, 84
- **Strix** flammea pratincola, 10
  - nebulosa, 85
- **Sturnella** magna, 72
- Summary, 118
- Summer Duck, 104
  - Red-bird, 51
  - Tanager, 51
  - visitants, 113
  - Warbler, 43
- Surf Scoter, 106
- Swallow, Bank, 52
  - Barn, 52
  - Cliff, 11, 52
  - Eaves, 52
  - Rough-winged, 11, 53
  - Sea, 109
  - White-bellied, 52
- Swallow-tailed Flycatcher, 75
  - Kite, 86
- Swamp Sparrow, 61
- Swan, American, 102
- Swift, Chimney, 79
- Swift-like birds, 79
- Swifts, 79
- Sylvicolidæ, 41
- **Symphemia** semipalmata, 96

T.

- Tanager, Scarlet, 51
  - Summer, 51
- Tanagers, 51
- Tanagridæ, 51
- Tattler, Greater, 96
  - Semipalmated, 96
- Tawny Thrush, 34
- Teal, Blue-winged, 104
  - Green-winged, 104
- Teeter-tail, 97
- **Telmatodytes** palustris, 40
- Tennessee Warbler, 42
- Tern, Common, 109
  - Forster's, 109
  - Least, 109
  - Marsh, 108
  - Short-tailed, 109
- Terns, 108
- Tetraonidæ, 92
- Thistle-bird, 58
- Thrasher, 36
- Thrush, Brown, 36
  - Eastern Hermit, 34
    - Olive-backed, 35
  - Golden-crowned, 47
  - Tawny, 34
  - Wilson's, 34
  - Wood, 34
- Thrushes, 25, 33
- Thrushes, Mocking, 35
  - Typical, 33
- **Thryothorus** bewicki, 10, 39
  - ludovicianus, 39
- Tidal-wave of birds, 28
- Tip-up, 97
- Titlark, 41
- Titmice, 37
- Titmouse, Black-capped, 37, 38
  - Carolina, 38
  - Tufted, 37
- Tomtit, 77
- **Totanus** melanoleucus, 96
- Towhee Bunting, 69
- Traill's Flycatcher, 78
- Tramp, 55
- Tree Sparrow, 63
- **Tringoïdes** macularius, 97
- Trochilidæ, 80
- **Trochilus** colubris, 80
- **Troglodytes** domesticus, 40
- Troglodytidæ, 39
- True Herons, 98
- Tube-nosed birds, 110

172. (167.) **Ægialites vociferus** (*Linn.*) *Cass.* KILDEER PLOVER.

Resident all the year round, or nearly so; most numerous in early spring and late autumn months, generally in small flocks, on commons, meadows, and plowed lands, as well as the Potomac flats. [584]

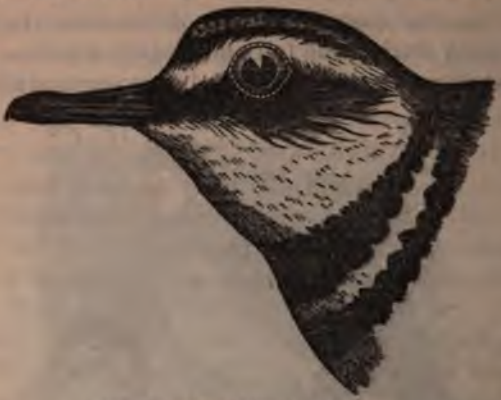


FIG. 78.—Head of Kildeer Plover.

173. (—.) **Ægialites semipalmatus** (*Bp.*) *Cab.* SEMIPALMATED PLOVER; "RING-NECK."

Not enumerated in the original edition, though there noted as "undoubtedly an inhabitant of the District"; since added to the list by Mr. Jouy, 1877. We have no details of the occurrence. One or two other species of the genus (*Æ. melodus, wilsonius*) may yet be seen here occasionally. [586]

FIG. 79.—Woodcock.

g Warbler, 12, 25, 42
ick's, 39
t Carolina, 39
se, 40
ter, 40

Y.

lied Flycatcher, 78
Woodpecker, 82
ed Cuckoo, 81
l, 58
asted Chat, 25, 49
l, 102
Yellow Red-poll Warbler, 46
Yellow-rumped Warbler, 44
Yellow-shanks, 96
Yellow-throat, Maryland, 11, 49
Yellow-throated Greenlet, 54
Warbler, 46
Yellow Warbler, 43
Yellow-winged Sparrow, 27, 60

Z.

Zenaidura carolinensis, 91
Zonotrichia albicollis, 64
leucophrys, 65
Zamelodia ludoviciana, 67

In our "Remarks" on the Jouy catalogue we spoke of this species as "certainly" occurring, though at that time not yet detected. Mr. Roberts informs us that he took a specimen in September, 1879. [609]

Micropalama himantopus may very possibly be occasionally found.

177. (170.) **Actodromas maculata** (*Vieill.*) *Coues.* PECTORAL SANDPIPER; "GRASS SNIPE;" "JACK SNIPE."

A spring and autumn visitant, but rarely seen at the former season. It used to be not uncommon from September 25 to November, singly or in flocks, in low, moist, grassy meadows, the boggy parts of the commons in the northern part of the city, as well as in the marshes along the rivers. We remember shooting it at some brick-kiln ponds which existed for many years near the present site of Iowa Circle, where we should as soon expect to see a Dodo now. [616]

178. (171.) **Actodromas minutilla** (*Vieill.*) *Coues.* LEAST SANDPIPER.

A spring and autumn migrant. In spring, from May 1 to 15; in fall, from August 25 to October. Inhabits the same places as the Grass Snipe. [614]

179. (172.) **Ereunetes pusillus** (*Linn.*) *Cass.* SEMIPALMATED SANDPIPER.

Rare, perhaps accidental, but occasionally met with in spring and fall, during the migrations, along the banks of the river. [612]

180. (173.) **Symphemia semipalmata** (*Gm.*) *Hartl.* SEMIPALMATED TATTLER; WILLET.

A spring and autumn visitant; rare. With reference to its distribution at large, the Willet should pertain rather to the category of summer visitants, but we do not know that it has ever been taken in the District at that season. [632]

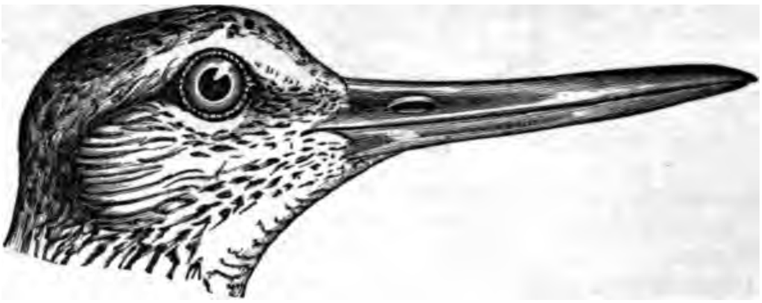


FIG. 82.—Head of Willet, nat. size.

181. (174.) **Totanus melanoleucus** (*Gm.*) *Vieill.* GREATER TATTLER; "YELLOW-SHANKS."

A common spring and autumn migrant. In spring, from May 1 to the 15th; in fall, from the middle of September until November. Gen-

Abercron
k
Dam
Run
Ra
Watts
agg's
Branch
ER
GION
000 feet
J. v. Glümer

the Potomac and winding the turns of Rock Creek. On occasion, as when fallen winged into the water, it swims and even dives to escape capture, with greater facility than would be expected to be possessed by a member of this family. Its gentle "peet-weet" is one of the familiar sounds along all the river courses. [638]

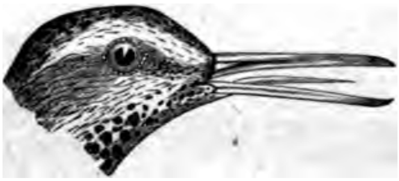


FIG. 85.—Bill of Spotted Sandpiper, nat. size.

185. (178.) **Bartramia longicauda** (*Bechst.*) *Coues.* (*Actiturus bartramius* of the original edition.) BARTRAMIAN SANDPIPER; UPLAND PLOVER; GRASS PLOVER; FIELD PLOVER.

A summer resident; rare at that season, and not common even during the migrations. Found altogether in high, dry fields and plowed lands. [640]

186 (179.) **Numenius longirostris** *Wils.* LONG-BILLED CURLEW.

A spring and autumn migrant, not uncommon, but remaining only for a brief period at either season. Observed in the fall about the middle of September, under circumstances similar to those noted in speaking of the Yellowshanks. [643]

There are several other waders of the Scolopacine and related families, which from their known distribution may be expected in the District. Such are other Curlews, the Great Marbled Godwit, and several Sandpipers. But we have warrant for the introduction of only those here enumerated.

Order HERODIONES: Herodian Birds.

Suborder HERODII: Herons.

Family ARDEIDÆ: True Herons.

187. (160.) **Ardea herodias** *Linn.* GREAT BLUE HERON; "BLUE CRANE."

To be found at intervals during the late summer and early fall months along the river; but it is not common, and we know of no instance of its breeding here. [655]

188. (159.) **Herodias egretta** (*Gm.*) *Gray.* GREAT WHITE EGRET.

Occasionally seen along the river during late summer and early fall months, but rare and irregular. Specimens have been obtained. [658]

189. (158.) **Garzetta candidissima** (*Gm.*) *Bp.* LITTLE WHITE EGRET.

Not uncommon about the marshes of the Potomac toward the end of summer and early in the fall. [659]

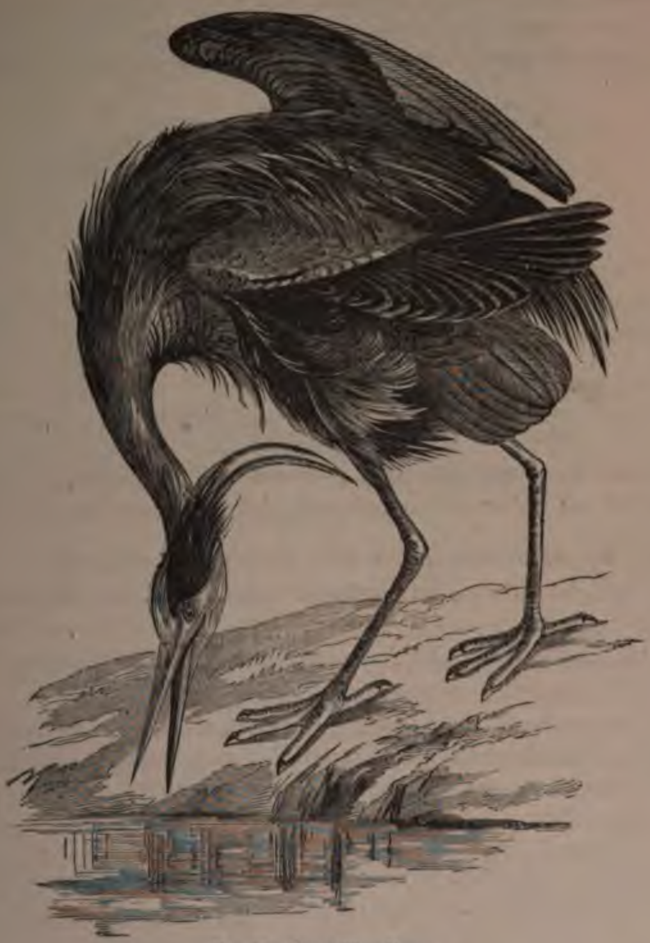


Fig. 86.—Great Blue Heron.

190. (161.) **Florida cœrulea** (*Linn.*) *Bd.* LITTLE BLUE HERON.

Rare, and only casual toward the end of summer. Specimen obtained. Perhaps some of the small white Herons attributed to the preceding species have been the present one in its white alternative plumage. [662]

191. (164.) **Butorides virescens** (*Linn.*) *Bp.* SMALL GREEN HERON; "FLY-UP-THE-CREEK;" "SCHYTEPOKE."

A summer resident, and the most abundant of its tribe; it may always be found during the summer along Rock Creek and about the marshes and estuaries of the Potomac. It used to nest at times in the "slashes," already often mentioned in this paper as within the city limits. It arrives the first of May and remains until the middle of September. [663]

192. (165.) **Nyctiardea grisea nævia** (*Bodd.*) *Allen.* (*N. gardeni* of the original edition.) NIGHT HERON.

Rare; *occasionally* seen during the latter part of the summer. [664]

193. (163.) **Botaurus mugitans** (*Bartr.*) *Coues.* (*B. lentiginosus* of the original edition.) BITTERN; STAKE-DRIVER; "INDIAN HEN."

Resident, and rather common. Found chiefly in the marshes of the Potomac and Anacostia, and boggy estuaries leading to these rivers. It is the only Heron which passes the winter here. [666]

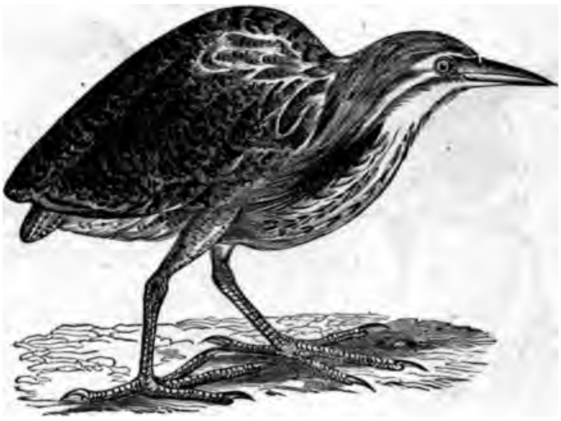


FIG. 87.—Bittern.

194. (162.) **Ardetta exilis** (*Gm.*) *Gray.* LEAST BITTERN.

A summer resident, rather uncommon. Arrives early in May and departs in September. Found chiefly in the *Zizania aquatica* marshes.

There are no heronries in the District to our knowledge; and the Small Green Heron is the only abundant and generally distributed representative of the family *Ardeidæ.* [667]

Order ALECTORIDES: Cranes and Rails.

Suborder GRUIFORMES: Cranes.

Family GRUIDÆ: Cranes.

195. (157.) **Grus pratensis** *Bartr.* (*G. canadensis* of the original edition.)

A specimen of this bird has been procured in the District. We doubt, however, that the bird has been seen here alive for the past quarter of a century, and it might properly be retired from the active list. [670]

Suborder RALLIFORMES: Rails.

Family RALLIDÆ: Rails.

196. (—.) **Rallus longirostris crepitans** (*Gm.*) *Ridg.* CLAPPER RAIL.

Not in the original edition. Has been observed but once, as we are informed both by Mr. Robert Ridgway and Mr. William Palmer. An individual was shot in the marsh above Long Bridge by Mr. Frank Ford, September 8, 1882. The occurrence so far from salt water is very unusual. [673]

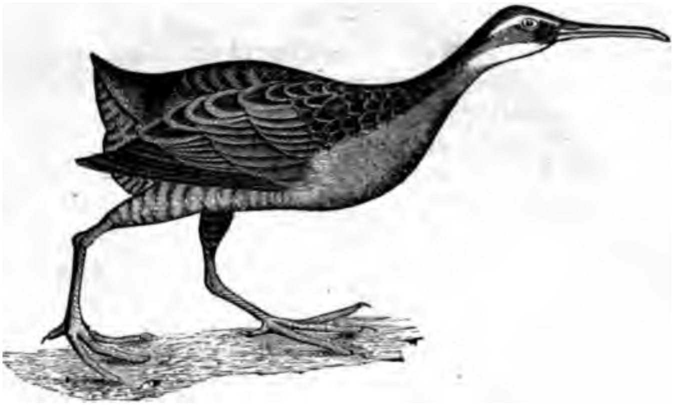


Fig. 88.—Clapper Rail.

197. (180.) **Rallus elegans** *Aud.* FRESH-WATER MARSH-HEN; "KING RAIL;" "KING ORTOLAN."

A spring and autumn migrant, remaining but a short time at each season. It is chiefly observed early in the autumn, when the marshes are so incessantly ransacked by the gunners, but is never common. [676]

198. (181.) **Rallus virginianus** *Linn.* VIRGINIA RAIL; "KING ORTOLAN."

A spring and autumn migrant; very rarely observed at the former season, and not abundant at any time. Found at the same times and in the same places as the Sora. [677]

199. (182.) **Porzana carolina** (*Linn.*) *Vieill.* COMMON RAIL; SORA; "ORTOLAN."

A spring and autumn migrant. It is not ordinarily noticeable during the former season, but at the latter it is very numerous in the marshes along the rivers, affording great sport from the latter part of August or the beginning of September until the first frost. It is commonly called the "Ortolan," a name having no applicability whatever. A description of rail-shooting is given in the introduction, in the article on the Anacostia River Region. [679]

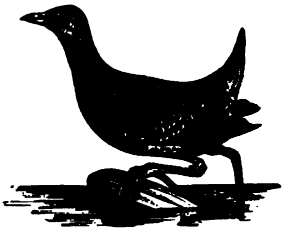


Fig. 89.—Sora.

200. (183.) **Porzana jamaicensis** (*Gm.*) *Cass.* LITTLE BLACK RAIL.

Very rare, perhaps only casual, during the migration. An individual was seen by ourselves, but unluckily not secured, in September, 1861. One was taken two or three years ago, and is now in the Smithsonian. [68]

The Yellow Rail, *P. noveboracensis*, is necessarily an inhabitant of the District, but during all these years we have never succeeded in establishing the fact, and are therefore obliged still to omit it.

201. (—.) **Gallinula galeata** (*Licht.*) *Bp.* FLORIDA GALLINULE.

Not in the original edition. According to our memoranda the Gallinule was first got here in the autumn of 1863, when a specimen, doubtless from the immediate vicinity, was bought in the market by Mr. C. Drexler. Others besides ourselves have since seen it in the District or vicinity. Mr. Palmer informs us it is occasionally found in the boats of the gunners who hunt for Rail in the fall. It was first added to the list by Mr. Jouy in 1877. In the spring of 1882 one flew into the city, became bewildered, and was captured alive by a boy whom we met carrying it over to the Smithsonian in expectation of a reward. [684]

202. (184.) **Fulica americana** *Gm.* COOT; "CROW DUCK."

A spring and autumn migrant; passing through early in the spring and returning in the fall, about the 1st of October. It is common at the latter season, and constantly exposed for sale in the market. [686]

Order LAMELLIROSTRES.

Suborder ANSERES: Anserine Birds.

Family ANATIDÆ: Geese, Ducks, &c.

203. (185.) **Cygnus columbianus** (*Ord*) *Coues.* AMERICAN SWAN.

A winter resident; not common. It is frequently exposed for sale in the market; but such individuals, and those which so commonly serve as signs for restaurants during the winter, are probably mostly shot on the Chesapeake, or, at any rate, not in the District. [689]

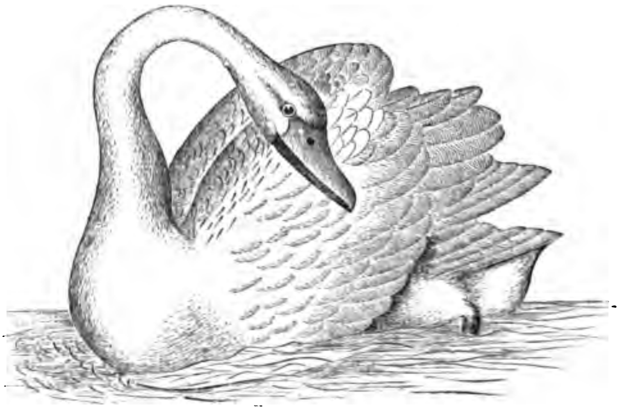


FIG. 90.—Swan.

204. (—.) **Bernicla brenta** (*Pall.*) *Steph.* BRANT GOOSE.

Not in the original edition. It has been added to the list by Mr.

spring of 1863, about the same time he secured the Gallinule above mentioned. Mr. Jouy placed it in the list in 1877. Mr. Ridgway informs us that this specimen, which is now in the United States National Museum, was from Alexandria, Va. [712]

211. (193.) **Mareca americana** (*Gm.*) *Steph.* AMERICAN WIDGEON.

A common winter resident; arrives about the 1st of October, and remains until some time in April. [713]

212. (190.) **Querquedula carolinensis** (*Gm.*) *Steph.* GREEN-WINGED TEAL.

An abundant winter resident. It arrives earlier than most of the Ducks—about the middle of September. [715]

213. (191.) **Querquedula discors** (*Linn.*) *Steph.* BLUE-WINGED TEAL.

One of the most abundant of the Ducks; a winter resident, but an early fall arrival, like the Green-winged Teal. [716]

214. (—.) **Spatula clypeata** (*Linn.*) *Boie.* SHOVELLER DUCK.

Wrongly omitted from the original edition. Winter resident. [718]

215. (194.) **Aix sponsa** (*Linn.*) *Boie.* SUMMER DUCK; WOOD DUCK.

Resident; seldom seen, however, except in winter, and at no time common. [719]

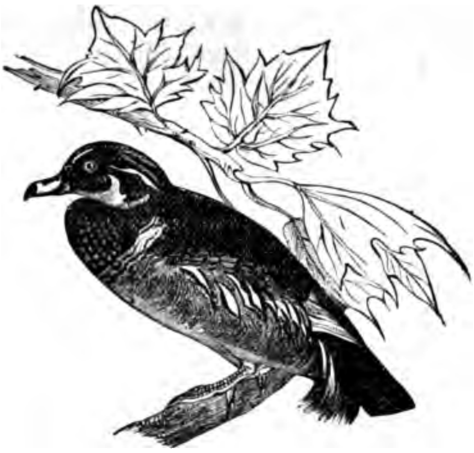


FIG. 92.—Wood Duck.

216. (195.) **Fuligula marila** (*Linn.*) *Steph.* GREATER BLACK-HEAD; SHUFFLER; RAFT DUCK; FLOCKING FOWL.

A winter resident; not very abundant, though often exposed for sale. [720]

217. (196.) **Fuligula affinis** *Eyt.* LESSER BLACK-HEAD.

A winter resident, like the preceding. [721]

218. (197.) **Fuligula collaris** (*Donov.*) *Bp.* RING-NECK DUCK.

A winter resident; rare. Arrives in the fall, about the last week in September. [722]

219. (198.) **Fuligula ferina americana** (*Eyt.*) *Coues.* AMERICAN RED-HEAD; "WASHINGTON CANVAS-BACK."

A winter resident; abundant. One of the commonest market Ducks, passing about half the time for the Canvas-back, and equally available for promoting Congressional legislation. [723]

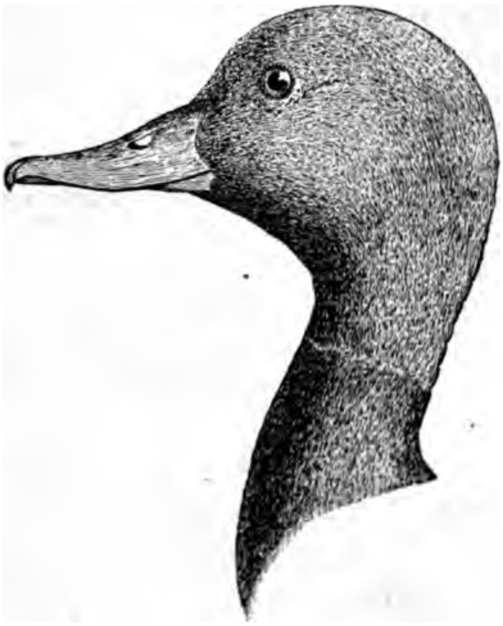


FIG. 98.—Red-head.

220. (199.) **Fuligula vallisneria** (*Wils.*) *Steph.* CANVAS-BACK.

A winter resident. It would appear from the state of the market to be very abundant here; but most of the Canvas-backs found in the restaurants probably come by rail from the Chesapeake. [724]

221. (200.) **Clangula glaucium** (*Linn.*) *Brehm.* (*Bucephala americana* of the original edition.)

A common winter resident. Little estimable for the table, but frequently seen in market. [725]

222. (201.) **Clangula albeola** (*Linn.*) *Steph.* BUFFLE-HEAD; "BUTTER-BALL."

A common winter resident. Arrives in the fall, about the middle of September; leaves in spring, the second week in April. [727]

223. (202.) **Harelda glacialis** (*Linn.*) *Leach.* LONG-TAILED DUCK; SOUTH-SOUTHERLY; OLD SQUAW.

224. (205.) **Œdemia americana** *Sw.* AMERICAN SCOTER.

225. (203.) **Œdemia fusca** (*Linn.*) *Flem.* (*Melanetta velvetina* of the original edition.) VELVET SCOTER.